

**THE LEGAL IMPLICATIONS  
OF BIOPROSPECTING  
IN THE ANTARCTIC REGION**

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# **The Legal Implications of Bioprospecting in the Antarctic**

## **Abstract**

The term 'bioprospecting' was only coined within the past few decades. Today, it is still difficult to find consensus on its legal meaning. What it appears to represent is the range of activities associated with searching for, discovering and researching unique biodiversity for any potential commercial applications. The polar regions are likely sources of such uniqueness. This is what attracts bioprospectors, as polar biodiversity often contain genes, molecules or compounds, that once isolated and assessed, can be developed into a product or process of commercial value in the fields of agriculture, medicine, aquaculture, cosmetics, and pharmacy to name only a few.

Bioprospecting in the Antarctic presents similar challenges to bioprospecting carried out anywhere else in the world. It also, however, carries with it unique challenges and implications specific to the Antarctic region. Bioprospecting has been underway in the Antarctic since the mid 1980s, within the context of National Antarctic programmes. Little formal debate, however, has taken place within the Antarctic Treaty System, the legal regime which governs the region. This thesis investigates the unique legal implications that bioprospecting has for Antarctica and the Southern Ocean. Antarctic bioprospecting also carries with it environmental and ethical implications. These will only be briefly discussed, but they too, carry with them legal obligations which are important in the context of the Antarctic.

The principle legal obligations are contained within the Antarctic Treaty; being the use of the area for peaceful purposes only, freedom of scientific investigation including the free availability of scientific observations and results, and the 'frozen' but unresolved sovereignty situation that prevails while the Antarctic Treaty is in force. Sovereignty considerations are particularly important when considering resource utilization and benefit-sharing from such utilization. Beyond the Antarctic Treaty, there exist international legal instruments which carry with them other obligations that cannot be ignored. Avoiding conflicts with these international instruments must also be a fundamental consideration in any Antarctic bioprospecting regulation. The extent of these legal obligations, and their implications for bioprospecting, is the focus of this thesis.

The thesis will explore these obligations and then investigate the possible future of bioprospecting in the Antarctic. Bioprospecting appears to be the latest challenge to the half century old Antarctic Treaty System. Each new challenge seems to prompt a call to investigate the system itself. So that every challenge has the possibility of altering or collapsing the system that appears to have worked extremely well in the past.

## Acknowledgements

This thesis is dedicated to my family and friends, especially to my husband Michael, to Mum (Bonnie) and Dad (Ed), Ann and Ken, Dawn, Andrew, Abbey and George, Heather, Mike and Alister, and Dan, Judi, Cameron and Brandon. All of whom have provided me with love, support and encouragement not only with this thesis but at other times in my life.

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This thesis is dedicated to Antarctica, and to those who recognise that it is a special place and are working to keep it that way.

*“And the end of all our exploring will be to arrive where we started  
and know the place for the very first time.” - T.S. Elliot*

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## List of treaties and major legal instruments

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*Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, opened for signature on 1979, (entered into force on 11 July 1984) ('*Moon Treaty*').

*Agreement on Trade-Related Aspects of Intellectual Property Rights*, opened for signature on 15 April 1994, 1869 UNTS 229 (entered into force 1 January 1995) ('*TRIPS Agreement*').

*Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*, COP VI Decision VI/24 ('*Bonn Guidelines*').

*Convention on Biological Diversity*, opened for signature on 5 June 1992, 31 ILM (1992) (entered into force 29 December 1993) ('*CBD*').

*Convention on the Conservation of Antarctic Marine Living Resources*, opened for signature on 20 May 1980, 19 ILM (1980) (entered into force 7 April 1982) ('*CCAMLR*').

*Convention on the Conservation of Antarctic Seals*, opened for signature on 1 June 1972, 29 UST 441 (entered into force 11 March 1978) ('*CCAS*').

*Convention on the Continental Shelf*, opened for signature on 29 April 1958, 450 UNTS 311 (entered into force 10 June 1964) art 2 (3).

*Convention on the Law of Treaties (Vienna)*, 8 ILM (1969) (entered into force 27 January 1980).

*Convention on the Regulation of Antarctic Mineral Resource Activities*, opened for signature on 25 November 1988, 27 ILM (1988) (not in force) ('*CRAMRA*').

Patents Act 1953 (NZ).

*Protocol on Environmental Protection to the Antarctic Treaty*, opened for signature on 4 October 1991, 30 ILM (1991) (entered into force 14 January 1998) ('*Protocol*').

The Antarctica Act 1960 (NZ).

*The Antarctic Treaty*, opened for signature 1 December 1959, 402 UNTS 71 (entered into force 23 June 1961) ('*Antarctic Treaty*').

*UN Convention on the Law of the Sea*, 21 ILM (1982), 1261 (entered into force 16 November 1994) ('*UNCLOS*').

## List of Acronyms

AFZ	Australian Fishing Zone
ASOC	Antarctic and Southern Ocean Coalition
AT	Antarctic Treaty
ATCM	Antarctic Treaty Consultative Meeting
ATS	Antarctic Treaty System
BAS	British Antarctic Survey
BIOROSS	Biodiversity of the Ross Sea
CBD	Convention on Biological Diversity
CCAMLR	Convention for the Conservation of Antarctic Marine Living Resources
CEP	Committee for Environmental Protection
CHM	Common Heritage of Mankind
COMNAP	Council of Managers of National Antarctic Programmes
COP	Conference of the Parties
CRAMRA	Convention for the Regulation of Antarctic Mineral Resource Activity
EEZ	Exclusive Economic Zone
FAO	Food and Agricultural Organisation
IAATO	International Association of Antarctica Tourism Operators
ICSU	International Council for Science
IGY	International Geophysical Year
IP	Information Paper
IPOA	International Plan of Action
IPR	Intellectual Property Rights
ISA	International Seabed Authority
IUCN	International Union for the Conservation of Nature
IUU	Illegal, Unreported and Unregulated
IWC	International Whaling Convention
LGP	Latitudinal Gradients Project
MFAT	Ministry of Foreign Affairs and Trade
NGO	Non-Governmental Organisation
SCAR	Scientific Committee for Antarctic Research
SOFSP	Southern Ocean Fisheries Survey Programme
TISGC	Treaty Initiative to Share the Genetic Global Commons
TRIPS	Trade Related Aspects of Intellectual Property
UNEP	United Nations Environment Programme
UNGA	United Nations General Assembly
WP	Working Paper

‘There are still areas of this planet where opportunities remain for constructive and peaceful cooperation on the part of the international community for the common good of all rather than for the benefit of a few. Such an area is the Antarctic continent. While we would refrain at this stage from commenting on the attitudes of States regarding the legal status of this last dark continent, or portions of it, there can be no doubt that there are vast possibilities for a new initiative that would rebound to the benefit of all mankind. Antarctica is an area where the now widely accepted ideas and concepts relating to international economic cooperation, with their special stress on the principle of equitable benefit sharing of the world’s resources, can find ample scope for application, given the cooperation and goodwill of those who have so far been active in that area.’

*Statement by Sri Lanka Delegate  
In a speech to the UN General Assembly  
8 October 1975*

# I LEGAL AND INSTITUTIONAL FRAMEWORK

## A Introduction

Antarctica is an enigma. Often described as the land of superlatives, including ‘highest’, ‘driest’, ‘coldest’ and ‘windiest’, it is actually incapable of adequate description simply by those general adjectives. It is a diverse continent supporting a range of environments covering both terrestrial and marine ecosystems. The region is also the scene of diverse efforts controlled by a legal system which seeks to find a balance among the differing goals freedom of scientific investigation, commercial exploitation and environmental preservation.

Antarctica has no permanent human population and no legally recognised sovereign. Seven states claim territory in Antarctica and two other states reserve the right to make a future claim, but none of these claims is formally recognised by the international community. There is therefore no ‘Antarctic government’ as such. Instead the region is governed by an international system known as the Antarctic Treaty System that currently has 47 participating states, 45 of which have ratified the Antarctic Treaty.<sup>1</sup>

This system has functioned effectively for the past 45 years. But that is not to say that it has not had to weather both internal and external challenges. These challenges have even led some to argue that the system should be replaced by an international institution, such as the United Nations. However, this threat to the system has yet to eventuate.

New challenges to the system always seem to be emerging. This thesis looks at the response of the Antarctic Treaty System to its latest challenge, bioprospecting. Bioprospecting efforts are those which involve the search for novel biodiversity, whose component parts may then be utilised in a product or process and developed for commercialisation. Scientists’ recent realisation of Antarctica’s potential as a source of unique biodiversity has aroused growing interest in the continent and its

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<sup>1</sup> *The Antarctic Treaty*, opened for signature 1 December 1959, 402 UNTS 71 (entered into force 23 June 1961) (*‘Antarctic Treaty’*).

surrounding marine environment. This interest has reawakened Antarctic challenges similar to those presented in the days of sealing and whaling, in the negotiations of a fisheries conservation and management agreement, in the management of the tourism industry and in the negotiations of a minerals extraction regime.

It appears that this latest challenge will not simply go away, as global commercialisation as a result of bioprospecting supports a lucrative industry. As a commercial enterprise, pharmaceutical products developed from globally sourced natural products for the cancer market alone were worth \$US16 billion in 1998.<sup>2</sup> In 2005, it is estimated that this market will be worth a staggering \$US24 billion.<sup>3</sup> Not since the late 1970s debate on Antarctic mineral resource extraction have the commercial stakes been so high. Even the fishing and tourism industry may pale in comparison to the commercial and therefore economic potential of a bioprospecting industry developing from Antarctic-derived natural products and processes.

The real legal challenge to the system then, stems from the obligations as stated in the Antarctic Treaty, the lack of a recognised sovereign for the region and the current global debates surrounding benefit-sharing from and access to the world's natural resources. The issue is further complicated because of the conflicting uses for Antarctica and multiple threats to this unique environment. These include the value of the region for scientific research; the increasing value of the region in economic terms; and the value of Antarctica, including its intrinsic value and wilderness value,<sup>4</sup> as recognised in the Protocol for Environmental Protection to the Antarctic Treaty 1991.<sup>5</sup> This presents the Antarctic Treaty state parties with a complicated issue for a region with conflicting uses and multiple threats.

Bioprospecting-related research associated with National Antarctic Programmes has been undertaken since the late 1980s and are currently taking place there. Already,

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<sup>2</sup> Murray Munro, 'Biodiversity and Bioprospecting in Antarctica' (Presentation delivered at the Graduate Certificate in Antarctic Studies Programme, Christchurch, 9 December 2003).

<sup>3</sup> Ibid.

<sup>4</sup> See generally, David Leary, 'Bioprospecting and the genetic resources of hydrothermal vents on the high seas: What is the existing legal position, where are we heading and what are our options?' (Paper presented at the High Seas Conference, Dunedin, 28-29 November 2003).

<sup>5</sup> *The Protocol for Environmental Protection to the Antarctic Treaty*, opened for signature 4 October 1991, 30 ILM 1991 (entered into force 14 January 1998) ('*Protocol*').

some 92 patents referring to Antarctic organisms, or to molecules extracted from them, have been filed in the US and a further 62 patents have been filed in Europe.<sup>6</sup> Discussion of bioprospecting, however, has only been formally, and briefly, discussed in the context of the Antarctic Treaty System since 2001.

Bioprospecting in the Antarctic is the single most urgent issue that has challenged the effective operation of the Antarctic Treaty System since the adoption (and subsequent abandonment) of the Convention on the Regulation of Antarctic Mineral Resources<sup>7</sup> (CRAMRA) in the late 1980s. Understanding the legal implications of allowing this activity to continue in the region is of critical importance to the Antarctic Treaty System. It is the goal of this thesis to contribute to and encourage formal debate of the issue and to provide a basic structure for that debate. The thesis will also propose legal solutions to the problems presented based on interpretation of Antarctic Treaty law and current international law principles.

### *1 Legal Questions to be Considered*

This thesis will examine the legal implications of bioprospecting in the Antarctic. The issues can be broadly addressed within three questions.

The first question is: *'Is bioprospecting a legitimate activity within the Antarctic Treaty area?'* While bioprospecting is already taking place in the Antarctic Treaty area, there is no agreed definition of the activity and there has been little formal debate concerning its legality within the confines of the Antarctic Treaty System. Bioprospecting has at times been labelled as a commercial activity that is outside the boundaries of scientific research and which therefore is in breach of one of the two primary objectives of the Antarctic Treaty. For this reason it is important to examine the Article II and III Antarctic Treaty obligations regarding cooperation in scientific investigation in Antarctica; and Article I obligations regarding peaceful purposes. While these objectives have been relatively easy to maintain under the control of national Antarctic research programmes, the obligation becomes more difficult to

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<sup>6</sup> Ian Sample, 'Cold rush threatens pristine Antarctic', *The Guardian* (UK), 2 February 2004, The Week, 1.

<sup>7</sup> *Convention on the Regulation of Antarctic Mineral Resources*, opened for signature on 25 November 1988, 27 ILM (1988) (not entered into force) ('CRAMRA').

regulate or enforce if private expeditions are launched. Cooperation under the Antarctic Treaty calls for the free availability of information, something which intellectual property right protection (compensation for an activity such as bioprospecting) may breach. Bioprospecting acts and activities may also cause harm to the environment or may have an environmental impact that is inconsistent with strict environmental protection mechanisms that are currently in place in the Antarctic Treaty area.

Answering this first question involves an examination of the Antarctic Treaty System, consideration of the definition of bioprospecting itself, a review of intellectual property rights and their function, and a review of the discussions regarding bioprospecting to date within the Antarctic Treaty fora. These are explored primarily in Part I and Part II of this thesis.

The second question is: *‘What are the significant legal challenges that the Antarctic Treaty System would face if it allowed bioprospecting to continue in the Antarctic Treaty area?’* This question is complicated by the disputed sovereignty situation which exists in the Antarctic, including the Southern Ocean marine region covered by the high seas exception in Article VI of the Antarctic Treaty. Thus, an exploration of sovereignty and jurisdiction in Antarctica is important, including an examination of the effects of Article IV of the Antarctic Treaty and the impact of developing international principles on the utilisation of global natural resources.

The issues regarding this second question are primarily presented in Part III of this thesis.

The final question is: *‘If bioprospecting in the Antarctic is deemed a legitimate activity, how might issues such as access to, and benefit-sharing from, exploitation of resources be regulated?’* While the access question clearly overlaps with the discussions on sovereignty, both access and benefit-sharing also raise questions about the internationalisation of Antarctica, the debates regarding Antarctica as a global commons and the institutions and legal instruments that may be required to regulate any commercial activity in the Antarctic region. This may require the negotiation of a new convention or measure within the Antarctic Treaty System, or regulation may be

possible within the context of, or by amendment to, one of the current legal instruments.

The issues related to the third question posed are explored in Parts III and IV of this thesis.

One may ask ‘Why bother?’ That is, why should there be any debate or legal discussion surrounding bioprospecting in the Antarctic? After all, the activity is already taking place in the region. The answer to the ‘Why bother’ question is easy; it is that, while an unlikely possibility, bioprospecting could arguably bring down the Antarctic Treaty System and may involve regulation from organisations outside of the system. This is an echo of the problems surrounding minerals exploitation from the 1980s and once again challenges the robustness<sup>8</sup> of the Antarctic Treaty System.

Bioprospecting is just the latest example of, at times, many conflicting uses of the area. Other uses include scientific research, tourism, and marine fisheries. These activities and their associated impacts in turn pose an as yet unquantified threat to the region, including its biodiversity. Utilizing Antarctic resources is complicated and consideration of the issue involves legal, political, environmental and ethical discussions and decisions that will require open, formal discussion within the Antarctic Treaty System.

### *B Defining ‘Antarctica’*

This thesis begins by reviewing the development and current content of the Antarctic Treaty System, the governing regime for the Antarctic region.

Difficulties immediately arise even as one begins to consider what is meant by ‘Antarctica’. There appears to be no universally accepted definition of ‘Antarctica’ or ‘Antarctic’<sup>9</sup>; even at the Washington Conference<sup>10</sup> of 1959 there was no agreement on

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<sup>8</sup> Cornelis van der Lugt, ‘An international environmental regime for the Antarctic: critical investigations’ (1997) 33 (186) *Polar Record* 223, 224.

<sup>9</sup> See William M Bush, *Antarctica and International Law* (1982) vol 1, 64-65.

<sup>10</sup> Conference on Antarctica (Washington, DC) 15 October 1959 – 1 December 1959.



the definition of these two terms.<sup>11</sup> For the purposes of this thesis ‘Antarctic’ and the ‘Antarctic region’ are both defined utilising the Antarctic Treaty limits – [therefore the Antarctic is the area defined by the Antarctic Treaty as] ‘the area south of 60° South Latitude, including all ice shelves...’<sup>12</sup>

The term ‘Antarctica’ on the other hand is usually used when referring to the continent itself. This would include ‘the continent, together with the islands rising from the continental block...lying almost wholly within the Antarctic Circle.’<sup>13</sup> For the purposes of this thesis, an attempt has been made to confine the term ‘Antarctica’ to the Antarctic continent, off-shore islands and the Antarctic ice shelves.

The Scientific Committee of Antarctic Research (SCAR) defines ‘Antarctic’ simply as the area bounded by the Antarctic Convergence.<sup>14</sup> The Convergence is a biological boundary which is constantly shifting, making it an impractical legal boundary. However, the Convention on the Conservation of Antarctic Marine Living Resources 1980<sup>15</sup> (CCAMLR) establishes as its territorial scope the area south of coordinates which roughly approximate to the Antarctic Convergence.<sup>16</sup> For the purposes of this thesis, the area referred to as the ‘Southern Ocean’ will be defined as the marine area south of the Antarctic Convergence and/or the coordinates, as listed in CCAMLR which roughly approximate it. It therefore consists of a conglomeration of large parts of the South Pacific, South Atlantic, and South Indian oceans each with its own distinct attributes.<sup>17</sup>

For the purposes of this thesis, all areas including the islands of the Sub-Antarctic region which are not the subject of disputed sovereignty are excluded from these discussions unless specifically referred to otherwise.

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<sup>11</sup> See, eg, comments by the United Kingdom in document UK0511955B and Argentina in document AR30071940 in Bush, above n 9.

<sup>12</sup> *Antarctic Treaty*, art VI.

<sup>13</sup> Mary Trewby (ed), *Antarctica: an Encyclopedia from Abbott Ice Shelf to zooplankton* (2002) 19.

<sup>14</sup> SCAR, *Constitution, Procedures and Structure of the Scientific Committee on Antarctic Research* (1958) s 1.

<sup>15</sup> *Convention on the Conservation of Antarctic Marine Living Resources*, opened for signature on 20 May 1980, 19 ILM (1980) (entered into force 7 April 1982) (‘CCAMLR’).

<sup>16</sup> CCAMLR, art I (4).

<sup>17</sup> Trewby, above n 13, 176.

## C Defining 'Bioprospecting'

### 1 No agreed definition

Internationally there is no universally agreed definition of 'bioprospecting'. While the activity builds on traditional techniques employed by humans since civilization began, advancements in technology have raised the activity to a new level over a relatively short period of time. At present there are no international legal agreements that specifically define or use the term 'bioprospecting'.<sup>18</sup> Even the Convention on Biological Diversity 1992<sup>19</sup> (CBD) and The Bonn Guidelines on Access to Genetic Resources and Benefit-sharing<sup>20</sup> (Bonn Guidelines), recently created legal instruments whose objectives involve the protection of biological diversity and regulation of access to and benefits derived from living resources, do not use the term. Arguably the lack of international agreement on a definition has done little to assist the Antarctic Treaty System in composing a comprehensive definition of bioprospecting.

A clear definition of the activity is important to Antarctic Treaty parties for a number of reasons. First, without an adequate definition there is difficulty understanding the breath and extent of the activity currently being carried out in the Antarctic. This makes adequate regulation of the activity and development of robust policy impossible. Second, any definition of the activity should clarify questions surrounding whether the activity can primarily be viewed as falling within the category of scientific research or within the context of commercialization. This distinction is critical within the Antarctic Treaty System, as the system prioritises activities for the benefit of scientific cooperation in the Antarctic region and not for the promotion or advancement of commercial opportunities. While commercialization is generally defined as 'to exploit for profit',<sup>21</sup> in the Antarctic, commercialisation is also synonymous with non-governmental activities. Such activities within the Antarctic Treaty System are generally deemed inferior to those associated with scientific research carried out as part of National Antarctic programmes.

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<sup>18</sup> See Donald Rothwell, 'Bioprospecting in Antarctica under the Antarctic Treaty System' in Alan Hemmings and Michelle Rogan-Finnemore (eds), *Antarctic Bioprospecting* (2005) (In press).

<sup>19</sup> *Convention on Biological Diversity*, opened for signature on 5 June 1992, 31 ILM (1992) (entered into force 29 December 1993) ('CBD').

<sup>20</sup> *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*, COP VI Decision VI/24 ('Bonn Guidelines').

<sup>21</sup> Collins Concise English Dictionary, 1995.

Recently, bioprospecting is being viewed as ‘a broad concept embracing a number of phases to investigate a region’s biodiversity and to collect samples of biological organisms’.<sup>22</sup> An exploration of the term and the activity, and a survey of the level of activity currently undertaken in the Antarctic, is therefore necessary to understanding the legal implications of bioprospecting there.

## 2 *Bioprospecting versus Biodiscovery*

While there is no agreed universal definition for the term bioprospecting, some have suggested that since the activity can be broken down into a number of phases, the definition and nomenclature should also be broken down into component parts. The suggestion has been made that the activity be characterised by two distinct terms: ‘biodiscovery’ and ‘bioprospecting’.<sup>23</sup>

***Biodiscovery*** would encompass phase one, which is the phase of scientific research into a region’s biodiversity including sample collection, where generally the initial size of any collected sample is small, and the environmental impact is minimal. In some cases, this phase may utilise ex-situ samples that were collected from a region for another purpose and are no longer needed for that purpose, or have been described and archived. This type of ex-situ utilisation would therefore only include the initial collection in Antarctica or the Southern Ocean (for the initial purpose), and it poses no new threat as to environmental impact being there is no return trip to Antarctica for sample collection. The exception could be unless any isolated natural chemical cannot be synthesised in a laboratory.

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<sup>22</sup> Julia Jabour-Green, ‘Bioprospecting in the High Seas’, (Report from the Bioprospecting in the High Seas Conference, Dunedin) 28-29 November 2003, 7.

<sup>23</sup> See, eg, Julia Jabour-Green and Dianne Nicol, ‘Bioprospecting in Areas outside of National Jurisdiction: Antarctica and the Southern Ocean’ (2003) 4 *Melbourne Journal of International Law* 76, 78.

*Bioprospecting* would cover the second and subsequent phases, including the recollection if required, of the biological organism for the purpose of further investigation. Jabour-Green and Nicol<sup>24</sup> describe subsequent phases along the lines of:

- Isolation, Characterisation and Culture;
- Screening for...Activity; and
- [Commercialisation including] Development of Product, Patenting, Trials, Sales and Marketing.

Bioprospecting projects require many years lead-in time before any commercialisation can be realised, the initial phase of the activity (phase one) is simply the start of any process that may produce a commercial outcome.<sup>25</sup> The distinction into the two categories of phases, implies that each phase has different objectives, different outcomes, and different requirements attached to them.<sup>26</sup>

For convenience and because there are legal implications of all phases of the activity, the term bioprospecting is used throughout this thesis to include all stages in the process unless specifically stated otherwise. It should be noted however, that currently, only the search and discovery phase is undertaken in the Antarctic region itself. Any subsequent phases of the activity are carried out, usually in the home country of the researcher.

### 3 *Relationship with Biodiversity*

The initial target of bioprospecting is the biodiversity of a region, including plants, animals and micro-organisms, in a range of environments. The likelihood of isolating a novel or useful biochemical compound increases with biodiversity. That is, the greater the biodiversity studied the more likelihood of a 'hit'.<sup>27</sup> Therefore bioprospecting efforts are often linked with efforts to understand the biodiversity of

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<sup>24</sup> Ibid, 85-87; Jabour-Green and Nicol define four phases in the process: 1 Sample Collection; 2 Isolation, Characterisation and Culture; 3 Screening for Pharmaceutical Activity; 4 Development of Product, Patenting, Trials, Sales and Marketing.

<sup>25</sup> Roberta Farrell and Shona Duncan, 'Uniqueness of Antarctica and Potential for Commercial Success' (Paper presented at the Bioprospecting in Antarctica Workshop, Christchurch, 7 - 8 April 2003) 8.

<sup>26</sup> Jabour-Green, above n 22, 7.

<sup>27</sup> Munro, above n 2.

an area.<sup>28</sup> While Antarctica's known biodiversity is low, it is predicted that at least the waters of the Southern Ocean contain a diverse range of micro-organisms and recently the Antarctic ice sheet has been shown to contain living micro-organisms. Also hot spots around volcanic areas such as Mount Erebus are likely to be biodiverse regions.

Of particular importance to bioprospectors are organisms that survive in extreme environments. The organisms that thrive in the often frozen ground and brackish internal waters of Antarctica and in the surrounding marine environment of the Southern Ocean, do so because they have developed 'unique biological coping strategies'.<sup>29</sup> Often it is these unique coping strategies that may be isolated and developed to address a specific target or purpose.

Biodiversity then is important for bioprospecting.

'Biological diversity' (or biodiversity) for the purposes of the CBD is defined as meaning:

'the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.'<sup>30</sup>

Researchers have yet to fully investigate this uniqueness for the Antarctic region. Because it is poorly known, the biota and especially the micro-organisms of Antarctica and the Southern Ocean hold an interest to biologists and chemists but also interest the biotechnology industry.<sup>31</sup> Biotechnology is also defined in the CBD as meaning 'any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use.'<sup>32</sup>

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<sup>28</sup> See generally Farrell and Duncan, above n 25; See also, *ibid*.

<sup>29</sup> Sample, above n 6, 1.

<sup>30</sup> *CBD*, art 2.

<sup>31</sup> See John Bowman, 'Antarctica a Global "Hot Spot": Biodiversity and Biotechnology' (Paper presented at Looking South-Managing Technology, Opportunities and the Global Environment, The Australian Academy of Technological Sciences and Engineering Symposium, Australia, November 2001).

<sup>32</sup> *CBD*, art 2.

For biotechnology companies the probability of a ‘hit’, that is, the probability that a natural product sample contains a compound that can be commercially developed into a useful product is wholly dependent on the number of samples obtained and, most importantly, the biodiversity of the samples and the biochemical diversity within. As stated above, the more novel the biodiversity investigated the more likely that something useful will be found.

#### 4 *Biota of the Antarctic*

The Antarctic region constitutes a large part of the world, nearly 10% in surface area. The continent itself hosts little avifauna and no terrestrial mammals.<sup>33</sup> Nevertheless, the organisms that do survive on the continent and in the Southern Ocean are among the most highly adapted animals on Earth, making it an important location for bioprospectors.<sup>34</sup>

It is not the goal of this thesis to investigate each and every individual species that occurs on Antarctica and in the Southern Ocean, but a brief summary as to the flora and fauna of the region will be a useful guide as to the likely bioprospecting targets and the impact that bioprospecting may have throughout the region.

Although the words ‘Antarctica’ and ‘Southern Ocean’ may generate images of two broad distinct environments and convey the idea that they contain little to no range of conditions or diversity, both Antarctica and the Southern Ocean are themselves environments which reflect a range of conditions.

Of particular importance for biodiversity and therefore for bioprospecting is the Southern Ocean. While supporting a relatively short food chain the marine ecosystem includes eight species of whales, six species of seals, numerous species of fish, krill, a diverse range of benthic creatures and hundreds maybe thousands of micro-organisms.<sup>35</sup> These marine animals consists of creatures capable of living in

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<sup>33</sup> Hadoram Shirihai, et al, *The complete guide to Antarctic wildlife: birds and marine mammals of the Antarctic continent and the Southern Ocean* (2002) 7.

<sup>34</sup> *Ibid.*

<sup>35</sup> SCAR, *Constitution, Procedures and Structure of the Scientific Committee on Antarctic Research* (1958) s 1.

conditions where temperatures are actually below freezing but the high salinity of the water prevents it from freezing solid. In response to these environmental conditions some fish have livers that are capable of producing a protein-carbohydrate that has the characteristics of an anti-freeze protein. This protein has already been isolated and patented (WO 01/44275) and is used in ice cream to make it smoother.<sup>36</sup>

Antarctica itself provides several differing environments and is not simply one solid block of ice with a few exposed rocks. Hot vent areas have already been found to be rich areas of biodiversity include Mount Erebus and Mount Melbourne both in the Ross Dependency Region.<sup>37</sup> The largest area of Antarctic exposed rocks is in the Dry Valleys (also within the Ross Dependency Region), while glaciers, fresh and brackish lakes, seasonal streams, and ice covered deep lakes, such as Lake Vostok, provide a range of diverse environments. Even the sewage outfall at the Amundsen-Scott South Pole Station has been a prospecting target.<sup>38</sup>

The Sub-Antarctic Island region may also provide a highly biodiverse and unique zone. However, as mentioned in the introduction to this thesis, this research will not include those Islands for two important reasons: First, most of the Sub-Antarctic Islands are by definition above the 60 degrees south latitude line and therefore, legally defined as outside of the Antarctic region; and second, all of the Sub-Antarctic Islands are claimed by states whose claims are undisputed and therefore there is no argument as to the sovereignty of the island or island group. Thus the permitting or the regulation of bioprospecting activities in the Sub-Antarctic Islands is an issue which may raise different legal implications from bioprospecting in the Antarctic region proper.

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<sup>36</sup> Barry Fox, 'Cold smoothie', *New Scientist* (England), 1 Sept 2001, 23.

<sup>37</sup> The Ross Dependency Region was established by New Zealand Order in Council, 30 July 1923, which defines its boundaries as 'all the islands and territories in Antarctica between the 160th degree of east longitude and the 150th degree of west longitude and south of 60 degrees south latitude...therefore, comprises the Ross Ice Shelf, the Balleny Islands, Scott Island and adjacent islands and the landmass within these longitudes to the point of their convergence at the South Pole.'

<sup>38</sup> See, eg, Report from the Committee for Environmental Protection (CEP IV), July 9-13, (2001) St. Petersburg, Russia; The prospecting was for meteorites but it does provide another environment where micro-organisms are found.

#### *D State-level definitions: Australia, New Zealand and the United States*

Discussion regarding regulation of bioprospecting is not only a recent phenomenon for the Antarctic, but also worldwide. Therefore, it is difficult to rely on any state's national policy, guidelines or legislation to assist in providing an adequate definition for use within the Antarctic Treaty System. Here, the current level of national discussions for Australia, New Zealand and the United States are presented as examples of the stages of development of bioprospecting policy at a national level within those three Antarctic Treaty party states.

##### *1 Australia*

Australia has recently finalised documentation<sup>39</sup> specifically dealing with bioprospecting in Australian territory. While the report includes reference to Australian Antarctic Territory, it does not specifically address bioprospecting in the Antarctic. It is noted in the report that there is no standard definition and 'there are different views on how far bioprospecting extends down the commercialisation path.'<sup>40</sup> Their policy document defines **bioprospecting** in its broader sense to reflect what it called common usage as:

'The search for valuable chemical compounds and genetic materials from plants, animals and micro-organisms. The term is sometimes used more narrowly to refer only to the initial collection of biological material for subsequent use for biodiscovery'.<sup>41</sup>

The term **biodiscovery** is then defined in the Australian document as: 'The extraction and testing of molecules for biological activity, identification of compounds with promise for further development, and research on the molecular basis for the biological activity.'<sup>42</sup>

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<sup>39</sup> Standing Committee on Primary Industries and Regional Services, House of Representatives Parliament of Australia, *Bioprospecting: Discoveries changing the future* (2001).

<sup>40</sup> *Ibid*, para 1.7.

<sup>41</sup> *Ibid*, para 1.8.

<sup>42</sup> *Ibid*, glossary.



The Australian document, in its discussion regarding ownership of biological materials, points out that ownership of biological resources is unclear and particularly complex in both the marine and Antarctic environments.<sup>43</sup>

Complicated issues in Australia include issues involving compensation for traditional knowledge, benefit-sharing with indigenous people and ownership or stewardship of native flora and fauna.

## 2 *New Zealand*

New Zealand has only in within the past two years begun formal discussions on bioprospecting in New Zealand territory and has recently produced a discussion document.<sup>44</sup> That discussion document defines bioprospecting generally as: ‘the examination of biological resources for features that may be of value for commercial development.’<sup>45</sup> This is a broad definition, encompassing all biological resources whether in-situ or ex-situ, however limiting the search to biological *resources* rather than simply all biological materials. The document does not however define biological resources and unlike the Australian document, it does not include any reference to Antarctica, nor to the Southern Ocean, the Sub-Antarctic Islands or the Ross Dependency Region.

Today government discussions of bioprospecting in New Zealand are in hiatus. It is believed the government has been too occupied with seabed and foreshore discussions and others have noted that the Waitangi Claim 262 concerning indigenous flora and fauna may be a stumbling block to bioprospecting policy, especially as regards access and benefit-sharing. After considerable discussion of the document which included a public consultation meeting in Wellington in February 2003, a representative of the Ministry of Economic Development (the government ministry leading the bioprospecting discussions for New Zealand) notes, ‘the Ministry has consulted on and considered the bioprospecting policy. Policy advice is currently with Ministers

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<sup>43</sup> Ibid, para 3.32.

<sup>44</sup> New Zealand Ministry of Economic Development, *Bioprospecting in New Zealand: Discussing the Options* (2002).

<sup>45</sup> Ibid, 3.

for consideration.’<sup>46</sup> This is how the situation stands even almost two years later, so that it appears that New Zealand will not have a domestic bioprospecting policy or guidelines any time soon; should there even be one, it does not appear from the current draft that the final document will include reference to the Antarctic or specifically the Ross Dependency Region.

### 3 *United States*

There is agreed policy in the United States concerning domestic bioprospecting. The US National Park Service in a document concerning Yellowstone National Park geothermal prospecting defined bioprospecting as ‘scientific research that looks for a useful application, process or product in nature.’<sup>47</sup> Yellowstone is an area where researchers have been collecting biological samples from the park’s hot springs since 1898 and it is the world’s first area designated as a national park.

The United States definition is very broad and although appearing to be grounded in science and the quest for knowledge, the use of the phrase ‘useful application, product or process’ is verbatim from United States Intellectual Property and Patenting legislation<sup>48</sup> and clearly conveys a wish to capitalise on a valuable commercial activity.

In the case of Yellowstone National Park, a contract<sup>49</sup> was prepared and signed between the US Federal Government and Diversa Corporation, a San Diego, California, biotechnology company. The contract gave Diversa the right to bioprospect Yellowstone National Park in exchange for an agreement to share in any potential financial returns. The contract sparked a lawsuit<sup>50</sup> which proposed that any such contract would be contrary to proper management of such public resources. The US Federal Court upheld the contract agreement.

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<sup>46</sup> Email from Daniel Brass to Michelle Rogan-Finnemore, 1 Dec 2003.

<sup>47</sup> Diversa-Yellowstone Cooperative Research and Development Agreement, United States, 17 August 1997.

<sup>48</sup> United States Code 35, ss101-103; See also, United States Constitution, art 1, s 8.

<sup>49</sup> Diversa, above n 47.

<sup>50</sup> *Edmonds Institute v Babbitt*, Civil Action 98-561 (RCL), United States District Court for the District of Columbia, 2000.

## *E The Antarctic Treaty System*

The Antarctic Treaty System (ATS) refers to ‘the whole complex of international legal instruments and arrangements made for the purpose of coordinating relations among states with respect to Antarctica’.<sup>51</sup> The genesis of the phrase is credited to the Argentine United Nations Ambassador who first introduced it in 1973,<sup>52</sup> the phrase has since been codified.<sup>53</sup> Today this phrase is commonly used and is legally defined in the most recent ATS instrument, the Protocol on Environmental Protection to the Antarctic Treaty 1991<sup>54</sup> (Protocol). The Protocol provides that Antarctic Treaty System means ‘the Antarctic Treaty, the measures in effect under that Treaty, its associated separate international instruments in force and the measures in effect under those instruments’.<sup>55</sup> The Handbook of the Antarctic Treaty System, although not a legal document as such, also includes within the ATS ‘the results of Meetings of Experts, the decisions of Special Consultative Meetings and, at a non-governmental level, reflects the work of the Scientific Committee on Antarctic Research (SCAR).’<sup>56</sup>

While the component parts of the Antarctic Treaty System cover a range of Antarctic issues, the ‘three pillars’<sup>57</sup> of the ATS are often said to be:

1. Safeguarding peace;
2. Ensuring freedom of scientific research; and
3. Protection of the Antarctic environment.

The first two pillars were proposed at the genesis of the Antarctic Treaty System in 1959, while the third pillar is reflected in subsequent Antarctic legal instruments beginning in 1964.

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<sup>51</sup> Harlan Cohan (ed), *Handbook of the Antarctic Treaty System* (9<sup>th</sup> ed, 2002) 1.

<sup>52</sup> See generally, A Jackson, et al, *On the Antarctic Horizon: proceedings of the International Symposium on the Future of the Antarctic Treaty System* (1996).

<sup>53</sup> Antarctic Treaty Consultative Meeting X, Recommendation X-1, 1979.

<sup>54</sup> *Protocol on Environmental Protection to the Antarctic Treaty*, opened for signature on 4 October 1991, 30 ILM (1991) (entered into force 14 January 1998) (‘Protocol’).

<sup>55</sup> *Protocol*, art 1(e).

<sup>56</sup> Cohen, above n 51, 1.

<sup>57</sup> Cornelis Johannes Bastmeijer, *The Antarctic environmental protocol and its domestic legal implementation* (2003) 12.

Central to the Antarctic Treaty System is the Antarctic Treaty 1959<sup>58</sup> (Antarctic Treaty) which was negotiated in under two years and signed at the Washington Conference. The Treaty is the core legal instrument which provides the foundation for the development and evolution of the system. The Treaty's primary purpose was to establish rules and procedures for the Antarctic region, so that scientific cooperation that was established and demonstrated as part of the International Geophysical Year (IGY, 1957-58) could continue without discord amongst interested states. The Antarctic Treaty allowed for continued cooperation amongst states and has been a successful foundation instrument for the management of Antarctic affairs. Even at the time of its negotiation however, it was not envisaged that the Treaty would be the only basis for the management of Antarctica and the Southern Ocean, it is the Antarctic Treaty System which has allowed the Treaty to have a much greater role than its original terms allowed. The Treaty was merely the start of an evolving regime that would be established to cope with a variety of management issues which the Antarctic Treaty itself was unable to deal with, or which, at the time of its signing, had not been foreseen or contemplated. According to Watts, the system's 'hallmarks appear to be institutional caution, coupled with institutional accretion.'<sup>59</sup>

The component parts of the Antarctic Treaty System are discussed in the next sections.

### *1 The Antarctic Treaty 1959<sup>60</sup>*

Much has been written about the Antarctic Treaty (Appendix 1) itself since its negotiation and subsequent ratification by the twelve<sup>61</sup> original signatory states. In the 1950s the backdrop of the Cold War, the success of the IGY and the recognition of the strategic value of the Antarctic region led to the negotiation of the Antarctic Treaty.

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<sup>58</sup> *The Antarctic Treaty*, opened for signature 1 December 1959, 402 UNTS 71 (entered into force 23 June 1961) ('*Antarctic Treaty*').

<sup>59</sup> Sir Arthur Watts, *International Law and the Antarctic Treaty System* (1992) 12.

<sup>60</sup> *The Antarctic Treaty*, opened for signature 1 December 1959, 402 UNTS 71 (entered into force 23 June 1961) ('*Antarctic Treaty*').

<sup>61</sup> Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, United Kingdom, United States and (former) USSR.

The Antarctic Treaty has been called ‘unique’<sup>62</sup> referring in part to its relative simplicity. Fourteen articles and a preamble have managed effectively to control a geographic region which occupies one tenth of the Earth’s surface. The Treaty’s two key objectives are stated initially in the preamble as: One, the use of Antarctica exclusively for peaceful purposes; and Two, support for international cooperation in scientific investigation in Antarctica. The original parties to the Antarctic Treaty agreed in the preamble statements that these objectives were in the interest of all mankind. These objectives are directly supported in the Antarctic Treaty in Articles I, II, and III. They are indirectly supported primarily by Articles IV, V, VII, and VIII. All of these Articles are discussed in more detail below.

The Treaty’s area of operation is stated as being ‘the area south of 60° south latitude, including all ice shelves...’<sup>63</sup> The article also presents a specific exclusion with regard to the high seas enclosed by the 60° south latitude line saying ‘nothing in the present Treaty shall prejudice or in any way affect the rights, or the exercise of the rights, of any State under international law with regard to the high seas within that area.’<sup>64</sup>

Other articles of the Treaty set up important administrative functions, including Article IX which outlines the designation of contracting party status primarily for the purpose of the yearly Antarctic Treaty Consultative Meetings (ATCMs).

The Antarctic Treaty is by virtue of its Article XIII (1) open for accession by any member state of the United Nations, or by any other state which may be invited to accede. Today, forty-five states have ratified the Antarctic Treaty (Appendix 2). The Treaty is often called successful, especially for maintaining non-militarization and denuclearization of the Antarctic region, as well as promoting scientific cooperation.<sup>65</sup> The Antarctic Treaty confers no rights and consists only of obligations;<sup>66</sup> it also contains little more than moral sanctions to ensure compliance and observance to its

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<sup>62</sup> Gerald Schatz, ‘Transnational Science and Technology in the absence of Defined Sovereignty: Development in the Polar Regions and in Legally Similar Situations’ in Gerald Schatz (ed), *Science Technology and Sovereignty in the Polar Regions* (1974), 1.

<sup>63</sup> *Antarctic Treaty*, art VI.

<sup>64</sup> *Ibid.*

<sup>65</sup> John Heap (ed), *Handbook of the Antarctic Treaty System* (8<sup>th</sup> ed, 1994) 107; See also, Christopher Joyner, *Governing the Frozen Commons: the Antarctic regime and environmental protection* (1998) 21.

<sup>66</sup> See generally, FM Auburn, *The Ross Dependency* (1972) 33.

principles. In addition it also lacks effective arbitration procedures and provisions for economic exploitation.<sup>67</sup>

*(a) Important Articles of the Antarctic Treaty for the Purposes of Bioprospecting Discussions*

For the purposes of any discussions regarding resource exploitation in the Antarctic and specifically to provide background to any discussion surrounding bioprospecting activities in the region, attention is drawn to a key articles of the Antarctic Treaty.

*(i) Article I*

Article I is obvious in its initial statement that ‘Antarctica shall be used for peaceful purposes only.’ While no definition of peaceful purposes is given, the article lists prohibitions as examples in support of the peaceful purposes objective. These include prohibition of any measures of a military nature such as the establishment of armed forces bases and related fortifications, the prohibition of carrying out of military manoeuvres and the prohibition of the testing of any type of weapons (in Antarctica). This was an important objective for the original 12 signatory parties given the political situation at the time of signing in 1959.

Article V directly supports the Article I objective, specifically prohibiting nuclear explosions in the Antarctic Treaty area, an activity of primary concern to the two superpowers at the time and clearly an activity that would breach the peaceful purposes objective.

*(ii) Articles II and III*

Articles II and III are here considered together, as while Article II succinctly states the second objective of the Antarctic Treaty, it is Article III which directly supports this objective by defining ways in which the objective can be effectively promoted. At the time of the negotiations of the Antarctic Treaty, Articles II and III were viewed as

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<sup>67</sup> Ibid.

being the minimum the parties could ‘get away with and still end up with a credible Treaty’.<sup>68</sup>

Article II states ‘Freedom of scientific investigation in Antarctica and co-operation toward that end, as applied in the International Geophysical Year, shall continue...’ The reference to ‘as applied in the International Geophysical Year’ (IGY) are important for at least two reasons. First, the IGY allowed for the valid participation of the Soviet Union in the Antarctic for the first time in the legitimate name of science.<sup>69</sup> Inclusion on this basis was critical and it was an affirmation of the apolitical nature of IGY activities. Second, there were obvious mutual benefits of closing the Antarctic to a Soviet military presence,<sup>70</sup> even while continuing to provide access for research purposes for all participants.

The success of the IGY presented a possibility that political disputes could be removed from the region by devoting the area exclusively to peaceful purposes. It also presented at least a temporary solution to the Antarctic territory problem, in that promotion of scientific investigation and research in the region could be used to underline the international value and significance of the region. In the United States government’s opinion this would ‘diminish the status of national territorial pretensions and also illustrate the limited nature of the contribution any one nation could make towards the solution of most Antarctic problems.’<sup>71</sup>

Freedom of scientific investigation therefore was, and continues to be, a principal object of the Antarctic Treaty which is also evidenced by other articles of the Antarctic Treaty and its preamble. The scientific community seized a unique opportunity when the political community recognized the advantages of scientific cooperation in the region as a way of avoiding political conflicts and perhaps violence.<sup>72</sup>

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<sup>68</sup> John Heap, ‘Cooperation in the Antarctic: a quarter of a century’s experience’ in Vicuna (ed) *Antarctic Resources Policy: Scientific, legal and political issues* (1983) 103, 105.

<sup>69</sup> Robert Swan, *Australia in the Antarctic: interest, activity and endeavour* (1961) 275.

<sup>70</sup> See Susan Buck, *The Global Commons: an introduction* (1998) 57.

<sup>71</sup> Swan, above n 69.

<sup>72</sup> See Buck, above n 70, 56-58.

Article III directly supports the Article II objective by providing examples of how this objective could be promoted, stating:

1. In order to promote international cooperation in scientific investigation in Antarctica, as provided for in Article II of the present Treaty, the Contracting Parties agree that, to the greatest extent feasible and practicable:

a. information regarding plans for scientific programs in Antarctica shall be exchanged to permit maximum economy of and efficiency of operations;

b. scientific personnel shall be exchanged in Antarctica between expeditions and stations;

c. scientific observations and results from Antarctica shall be exchanged and made freely available.

The success of the IGY meant that parties envisioned that these requirements would be easy to maintain. It was not envisioned however, that the proviso for the free availability and exchange of scientific observations and results would prove problematic in any commercial era if one was ever to develop. In fact, little to no attention was directed towards the prospect of commercial operations in the region. It is 'section c' that requires the greatest level of consideration in the context of the legal implications of bioprospecting in the Antarctic, as it is believed that the commercial nature of that activity prevents observations and results from being exchanged and made freely available. Further consideration of this issue is therefore discussed in Part II of this thesis.

### *(iii) Article IV*

While the two key objectives of the Antarctic Treaty as discussed above are often cited as critical to the success of the Antarctic Treaty, it is Article IV which deals with territorial claims to Antarctica that was undoubtedly 'the political key'<sup>73</sup> which was critical to the signing of the Antarctic Treaty in the first place. Article IV was essential to appease all signatory parties each with a varying view of the Antarctic territorial claims. Therefore while it only indirectly supported the two key objectives of the Treaty, the absence of this Article would arguably have resulted in no treaty at all.

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<sup>73</sup> Christopher Beeby, *The Antarctic Treaty* (1972) 10.



Article IV is, therefore, the critical element in the Antarctic Treaty, often called the ‘cornerstone’,<sup>74</sup> of the Treaty because it addresses the conundrum of disputed territorial sovereignty in Antarctica. Article IV was, initially, and today remains, critical to the success of the Antarctic Treaty and therefore the Antarctic Treaty System. Joyner calls it the legal ‘flexi-gluce that allows the Treaty to work for governments who hold diametrically opposed positions on the contentious question of territorial sovereignty over the continent’.<sup>75</sup>

Article IV of the Antarctic Treaty begins by addressing the situation negotiators to that Treaty were presented with in 1959, namely the status of the territorial claims and the views and positions of the non-claimant states at that point in time. Article IV (1) reads:

1. Nothing contained in the present Treaty shall be interpreted as:
  - a. a renunciation by any Contracting Party of previously asserted rights of or claims to territorial sovereignty in Antarctica;
  - b. a renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;
  - c. prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's rights of or claim or basis of claim to territorial sovereignty in Antarctica.

This is a complex provision, once criticised as a ‘purgatory of ambiguity’.<sup>76</sup> But this criticism, according to Joyner, ignores the chief purpose of Article IV, namely to provide a politically workable arrangement for all states involved.<sup>77</sup>

The complexity arises from the need to provide protection for varying views and positions on sovereignty in Antarctica. For those seven states which asserted a territorial claim before 1959 the Article’s section (a) protects their respective claims and does not require them to abandon their claim. Section (b) protects the basis of any

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<sup>74</sup> FM Auburn, *Antarctic law and politics* (1982) 104.

<sup>75</sup> Joyner, above n 65, 58.

<sup>76</sup> Gillian Triggs, *International law and Australian sovereignty in Antarctica* (1986) 137.

<sup>77</sup> See generally, Joyner, above n 65, 56-58.

claim (without comment as to legitimacy or otherwise) thus protecting not only the position of the basis for the territorial claimants, but also those states who have stated that they too have a basis of claim and reserve the right to make a future claim. While providing additional protection for the position of the seven claimant states, this provision was inserted primarily for the protection of the two states, which while saying that they each have a basis for a territorial claim to Antarctica, do not formally assert any claim to territory. Finally section (c) allows states that do not recognise any or all of the claims, or basis for claims, to become a party to the Treaty without jeopardising their position as regards sovereignty in Antarctica. This applied not only to non-claimant states but also to those states with overlapping territorial claims.

Article IV was also important to those states that participated in the Washington negotiations which, at the time of the signing of the Antarctic Treaty, had neither territorial claim nor basis of claim to any portion of Antarctica. Originally there were three such states-clearly a minority among the twelve original signatories.<sup>78</sup> Today, the seven claimant states represent the minority among the 45 states that are now party to the Antarctic Treaty. For every decision made in the Antarctic Treaty forum, an internal accommodation must always be made to appease the varying views of this diverse group of states.

Article IV, paragraph 2 then goes on to establish rules for the future, that is, beyond the condition that existed in 1959, by stating that:

2. No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

This makes it clear that the positions of the signatory states with an interest in territory in Antarctica, can neither be made worse nor improved by any acts or activities undertaken in Antarctica during the currency of the Antarctic Treaty, except in the

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<sup>78</sup> The seven claimant states are: Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom; In addition the United States and (former) USSR maintain they have a basis of claim, but do not make a claim to territory; the three additional original signatories were Japan, South Africa and Belgium all of whom had participated in the IGY by carrying out scientific research in Antarctica.

case as against any third party state. It also makes it plain that no new assertions to territory or extensions can be made by any of the signatories.

This leaves little doubt that the territorial claims to Antarctica continue to persist today. While the issue as to sovereignty remains unresolved the legal operation of the territorial claims are held in abeyance by Article IV and the position as it existed in 1959 has not been legally challenged. The question as to whether the claims to territorial sovereignty in Antarctica are valid has never been decided upon by international arbitration or adjudication. It is within this context that any discussion regarding living or non-living resources in the Antarctic must be addressed. This creates complicated issues surrounding access to and ownership of resources which will be discussed later in this thesis.

*(iv) Article VIII*

Jurisdiction is a manifestation of state sovereignty, defined as ‘the capacity of a state to prescribe, adjudicate and to enforce a rule of law’.<sup>79</sup> As a general rule, jurisdiction has a territorial basis. Because of the unresolved nature of Antarctic territorial claims, issues surrounding jurisdiction are complex, the problem being how to allocate jurisdictional powers among the Antarctic Treaty states. Only Article VIII of the Antarctic Treaty makes mention of jurisdiction in Antarctica stating:

‘without prejudice to the respective positions of Contracting Parties relating to jurisdiction over all other persons in Antarctica, observers designated under paragraph 1 of Article VII and scientific personnel exchanged...and members of staff accompanying any such persons, shall be subject only to the jurisdiction of the Contracting Party of which they are nationals in respect of all acts or omissions occurring while they are in Antarctica...’<sup>80</sup>

This provision fails to address jurisdictional issues related to persons who are not part of a National Antarctic Programme, so that individuals who are part of private expeditions to the Antarctic are not covered by this provision. While initially this was not a problem, as all expeditions to Antarctica were state-led

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<sup>79</sup> *The CCH Macquarie Dictionary of Law* (2<sup>nd</sup> ed) (1993) 95.

<sup>80</sup> *Antarctic Treaty*, art VIII.

expeditions, the increase in private expeditions has led to states implementing domestic legislation closing the gap and covering these individuals while in the region.<sup>81</sup> Any application of the general principle of jurisdiction, that is, giving claimant states jurisdiction over all persons in their Antarctic claimed territory could well ‘give rise immediately and directly to disputes about sovereignty’.<sup>82</sup>

(v) *Article IX*

The Antarctic Treaty contained little in the way of institutional provisions when it was negotiated and signed. For example, it deliberately ignored the creation of a treaty secretariat. The Antarctic Treaty’s Article IX is the sole crucial provision of an institutional nature, providing for the holding of periodic meetings but not being prescriptive as to when and, except initially, where they should occur. Article IX (1) simply states that representatives of the ‘Contracting Parties...shall meet at the City of Canberra within two months after the date of entry into force of the Treaty, and thereafter at suitable intervals and places...’ After the first meeting in Canberra and until 1994 the parties met every second year, rotating among contracting state venues. However, since 1994 the parties have met annually, the increase in frequency of meetings reflecting the increase in the number of issues of substance that are now discussed in the Antarctic Treaty forum.

Article IX (1) stipulates three purposes for the meetings:

1. exchanging information;
2. consulting together;
3. formulating and considering, and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty.

It is the second purpose that has served as the basis for the accepted title for these now annual meetings, referred to as Antarctic Treaty Consultative Meetings (ATCMs). Final Reports from each ATCM become the documents that support the evolution of

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<sup>81</sup> See, eg, for New Zealand, *Antarctica Act* 1960.

<sup>82</sup> Beeby, above n 73, 11.

the system and add to that system.<sup>83</sup> Membership and participation at ATCMs are a representation of ‘supranational tribunals as a way to accommodate differences but acknowledge and reinforce common values.’<sup>84</sup>

Paragraph 2 of Article IX goes on to establish each contracting parties’ level of participation at these meetings, allowing for the plenary body of the institution comprising the membership as a whole, but also creating a limited membership comprised of contracting parties who will exercise certain important functions central to the work of the system. For the Antarctic Treaty parties this distinction is represented by the designation as either a ‘Consultative State’ or a ‘Non-Consultative State’.

In order to obtain the ‘higher’ Consultative State status, an Antarctic Treaty signatory state must meet certain activity criteria. Specifically the state must ‘demonstrate its interest in Antarctica by conducting substantial scientific research activity there...’<sup>85</sup> No definition of what ‘substantial scientific research activity’ means is provided, however the paragraph lists two illustrative examples: One, establishment of a Antarctic scientific station or two, dispatch of a scientific expedition in Antarctica. This requirement for substantial scientific research activity only applies to acceding states, the original twelve Antarctic Treaty signatories automatically acquiring and unqualifiedly retaining Consultative State status regardless of their level of Antarctic activity.

In addition to the Antarctic Treaty requirements for obtaining Consultative State status, a further qualification has now been established by the Protocol on Environmental Protection to the Antarctic Treaty 1991,<sup>86</sup> (Protocol) whereby in order for a state to obtain Consultative State status, a signatory state must meet the criteria as laid down in the Antarctic Treaty *and* must also have ratified, accepted and approved the Protocol.<sup>87</sup>

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<sup>83</sup> Reports from Antarctic Treaty Consultative Meetings can be found through the Antarctic Treaty Secretariat web page at [www.ats.org.ar](http://www.ats.org.ar).

<sup>84</sup> Anne-Marie Slaughter, ‘The real new world order’ (1997) 76 *Foreign Affairs* 183, 187.

<sup>85</sup> *Antarctic Treaty*, art IX (2).

<sup>86</sup> *The Protocol for Environmental Protection to the Antarctic Treaty*, opened for signature 4 October 1991, 30 ILM 1991 (entered into force 14 January 1998) (*Protocol*).

<sup>87</sup> *Protocol*, art 22 (4).

For those states with a genuine interest in Antarctica, Consultative State status is important, as only Consultative States have voting rights and full participation rights at ATCMs, this higher status also gives the state an opportunity to host Antarctic Treaty Consultative Meetings. New signatory states to the Antarctic Treaty System have to take the system as they find it, but by obtaining Consultative State status they can then seek to change and influence its development.

All other states which have acceded to the Antarctic Treaty, initially have Non-Consultative State status. They have observer status at all ATCMs, have the ability to prepare and present Information Papers, but do not have voting privileges. Should a Non-Consultative State wish to acquire Consultative State status it must ratify the Protocol, meet the requirements of Article IX of the Antarctic Treaty and apply for Consultative State status at an ATCM. It is only then, by consensus of all Antarctic Treaty Consultative States, that its higher status may be approved.

## 2 *Recommendations*

Article IX of the Antarctic Treaty set up the mandate for the formulation and implementation of ‘measures in furtherance of the principles and objectives of the Treaty...’<sup>88</sup> Paragraph 1 then goes on to list six subjects that may be dealt with by way of these measures; these subjects have been divided into four broad categories: Operations; Environment; Science; Treaty. Since the Antarctic Treaty came into force in 1961 the Antarctic Treaty Consultative Parties have agreed to 228 Recommendations.<sup>89</sup> By far the largest number of Antarctic Treaty Recommendations fall into the environment category, commencing with The Agreed Measures for Flora and Fauna 1964<sup>90</sup> (Agreed Measures) adopted through Recommendation III-8 at ATCM III in Brussels.

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<sup>88</sup> *Antarctic Treaty*, art IX para 1.

<sup>89</sup> Since 1995 recommendations have been broken down into measures, decisions and resolutions; See discussion below.

<sup>90</sup> *Agreed Measures for the Conservation of Antarctic Fauna and Flora*, Misc. 23 (1965) Cmnd. (‘Agreed Measures’).

The Antarctic Treaty is relatively silent on the subject of natural resources, because in 1959 resource issues were not the focus of the parties; the region was more important to them from a strategic standpoint. Nevertheless, the non-exhaustive list of Consultative State party responsibilities as contained in Article IX of the Antarctic Treaty, does include ‘measures regarding the preservation and conservation of living resources in Antarctica’.<sup>91</sup> The Antarctic Treaty Consultative State parties have used this Article to support their argument that they have a right to regulate Antarctic living resources, more commonly referred to now as natural resources.

On balance, it has been noted that the process of adopting recommended measures has worked sufficiently well.<sup>92</sup> In the past, however, there was been some debate surrounding the legally binding nature of the Recommendations. Article IX (1) Antarctic Treaty refers to representatives of Antarctic Treaty Consultative Parties ‘recommending to their governments certain measures...’ Rothwell<sup>93</sup> believes that this may seem to indicate that such recommendations have no legally binding effect. Article IX (4) states that ‘the measures referred to in paragraph 1 shall become effective when approved by all the contracting parties’ implying that the recommendation itself is not legally binding, but that the measure, once approved, is.

Since 1995 the situation regarding the legal nature of recommendations has been clarified, with the Antarctic Treaty parties introducing a hierarchy of importance. Recommendations are now broken down into three categories: measures, decisions and resolutions.<sup>94</sup> Measures are defined as: ‘A text which contains provisions intended to be legally binding once it has been approved by all Antarctic Treaty Consultative Parties.’<sup>95</sup> While a decision is ‘taken by an Antarctic Treaty Consultative Meeting as an internal organizational matter...which will be operative at adoption or at such other time which may be specified.’<sup>96</sup> Finally a resolution is defined as ‘hortatory text adopted at an Antarctic Treaty Consultative Meeting’<sup>97</sup> The distinction reflected the

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<sup>91</sup> *Antarctic Treaty*, art IX (1)(f).

<sup>92</sup> See Christopher Joyner, ‘Recommended measures under the Antarctic Treaty: Hardening Compliance with Soft International Law’ (1998) 19 *Michigan Journal of International Law* 401.

<sup>93</sup> Donald Rothwell, *The Polar regions and the development of international law* (1996) 94.

<sup>94</sup> Antarctic Treaty Consultative Meeting XIX: Decision 1 (1995).

<sup>95</sup> *Ibid*, para 1(a).

<sup>96</sup> *Ibid*, para 2(a).

<sup>97</sup> *Ibid*, para 3(1).

need for clarity, including the need of the parties to better understand the Recommendations in light of the ever-increasing number of decisions of various kinds made over the years by the Consultative State parties.<sup>98</sup> Once a measure becomes effective it is an integral part of the Antarctic Treaty System; Article X of the Antarctic Treaty applies and Antarctic Treaty Consultative State parties are bound by it. They are arguably<sup>99</sup> not independent or individual treaties nor should they be accorded such status, even though there is little doubt that instruments like the Agreed Measures have the necessary requirements to be classified as a treaty, even though it was not the intention of the parties that they be given such status.

### 3 *Associated Instruments*

While the primary component of the Antarctic Treaty System is the Antarctic Treaty, other components of the system have been developed over the past 40 years which have made their separate contributions to the structure of the system. These are discussed below.

#### *(a) Agreed Measures for the Conservation of Antarctic Fauna and Flora 1964<sup>100</sup>*

Article IX (1) (f) of the Antarctic Treaty states that recommendations may include ‘measures regarding preservation and conservation of living resources in Antarctica.’ This option was taken up during the inaugural ATCM in 1961 when negotiations began regarding the conservation of Antarctic flora and fauna. By 1964, the Consultative Parties adopted Recommendation III-VIII entitled The Agreed Measures for Antarctic Fauna and Flora (The Agreed Measures), which established a means for designating protected areas in Antarctica and specially protected species. The Agreed Measures also included a permit requirement for harmful interference with native mammals and birds, and for the introduction of non-indigenous species. However the Agreed Measures have now largely been superseded by the Protocol. In due course, it is expected that the Antarctic Treaty Parties will confirm that the Agreed Measures

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<sup>98</sup> Antarctic Treaty Consultative Meeting XXIV: Resolution 1 (2001).

<sup>99</sup> See Rothwell, above n 93 and Watts, above n 59; Cf Bush, above n 9.

<sup>100</sup> *Agreed Measures for the Conservation of Antarctic Fauna and Flora*, Misc. 23 (1965) Cmnd. (‘Agreed Measures’).



are redundant<sup>101</sup> and can be repealed. The Agreed Measures remain an important document in the evolution of the ATS, reflecting the recognition of the Antarctic Treaty parties of the need to protect components of the Antarctic ecosystem.

*(b) Convention for the Conservation of Antarctic Seals 1972*<sup>102</sup>

The first attempt at protecting an Antarctic resource by way of a freestanding convention was to deal with the plight of Antarctic seals. The major fur seal populations of the South Atlantic were virtually wiped out by the 1820s. The Agreed Measures protected seals that were on land but did not cover those that were in the water, nor those that were resting on floating ice. A legal instrument to fill this gap and protect those seals was needed as the hunting of seals was a big industry. The choice lay between, on the one hand, following the precedent of the Agreed Measures and incorporating the agreement in the form of an Antarctic Treaty Recommendation and, on the other hand, adopting a free-standing instrument. The Consultative State parties chose the later course by negotiating and opening for signature the Convention for the Conservation of Antarctic Seals (CCAS) in London in 1972. CCAS is of indefinite duration and may be amended at any time.<sup>103</sup> It covers all seals in Antarctic waters, defines hunting zones and seasons combined with conservative catch limits and a permit system. New Zealand signed CCAS in London in 1972 but has never ratified it, largely due to the fact that the harvesting of seals had all but ceased by this time.<sup>104</sup> Although seals are occasionally taken for scientific purposes, there have been no attempts to commercially harvest Antarctic seals since 1964.

*(c) Convention on the Conservation of Antarctic Marine Living Resources 1980*<sup>105</sup>

The recognition of the importance of krill in the Antarctic marine food chain and the development of large, distant water, freezer trawlers lent a feeling of urgency to the consideration of marine living resources of the Southern Ocean which was included as

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<sup>101</sup> Neil Gilbert, 'Antarctica and Environmental Management' (Presentation delivered at the Graduate Certificate in Antarctic Studies Programme, Christchurch, November 2003) 5.

<sup>102</sup> *Convention on the Conservation of Antarctic Seals*, opened for signature on 1 June 1972, 29 UST 441 (entered into force 11 March 1978) ('CCAS').

<sup>103</sup> CCAS, art 8 (1).

<sup>104</sup> Any taking of seals by a New Zealand vessel would be regulated by the *Marine Mammals Protection Act* (1978), specifically para 16, which covers the Ross Dependency Region.

<sup>105</sup> *Convention on the Conservation of Antarctic Marine Living Resources*, opened for signature on 20 May 1980, 19 ILM (1980) (entered into force 7 April 1982) ('CCAMLR').

an agenda item<sup>106</sup> of ATCM IX in 1977. Soon after, the negotiation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) began and was concluded in May 1980.

The economic use of marine resources was not at that time covered by the existing Antarctic Treaty System framework and ‘CCAMLR negotiations were conducted in secret, preserving the dominant role of the Antarctic Treaty Consultative State parties and preventing external interference.’<sup>107</sup> CCAMLR became the principal legal instrument adopted by Antarctic Treaty parties to deal with the conservation and management of marine living resources. Although CCAMLR was developed in response to the potentiality for over-harvesting of krill, it was soon recognised as the only Antarctic Treaty arrangement that could manage fin fish fisheries in the Southern Ocean, an industry the was quick to develop.

CCAMLR’s objective is the conservation of marine living resources in the Southern Ocean.<sup>108</sup> By definition ‘conservation’ in CCAMLR includes ‘rational use’<sup>109</sup> and so CCAMLR allows harvesting within set limits and in a prescribed manner. CCAMLR applies to ‘Antarctic marine living resources’<sup>110</sup> and defines those as meaning ‘the populations of fin fish, molluscs, crustaceans and all other species of living organisms, including birds...’<sup>111</sup> CCAMLR has a resource focus providing guidance on utilisation, conservation and management<sup>112</sup> for the purposes of extraction of this marine resource ‘as a source of protein.’<sup>113</sup>

CCAMLR contained a number of innovations.<sup>114</sup> First, CCAMLR adopted an ‘ecosystem approach’ to the protection of marine resources, requiring that the effects of dependent and associated species must be taken into account when allowing for

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<sup>106</sup> Antarctic Treaty Consultative Meeting Report VIII, Oslo, 9-20 June 1975, Ministry of Foreign Affairs: Oslo, 1976, 40; Recommendation VIII-10 ‘Antarctic Marine Living Resources’, to be included on the agenda at ATCM IX.

<sup>107</sup> Dillon Burke, *Exploiting the Last Ocean* (PhD Thesis, University of Canterbury, 2001) 72.

<sup>108</sup> CCAMLR, art II (1).

<sup>109</sup> CCAMLR, art II (2).

<sup>110</sup> CCAMLR, art I (1).

<sup>111</sup> CCAMLR, art I (2).

<sup>112</sup> See generally, Donald Rothwell and Ruth Davis, *Antarctic Environmental Protection: a collection of Australian and international instruments* (1997) 58-59.

<sup>113</sup> CCAMLR, preamble.

<sup>114</sup> Cohan, above n 51, 353.

catch/harvest quotas, thereby conserving the relationship between all living species in the CCAMLR region. That is, CCAMLR protects not only the species that is targeted for harvest, but also those which may be connected through the food chain.<sup>115</sup> This ecosystem approach is reflected in the second innovation, that the area of application of CCAMLR is larger than the area covered by the Antarctic Treaty (Map 1, Appendix 3). The northern limit of the CCAMLR is the northern limit of the Antarctic marine ecosystem-up to the 60° South latitude line and including the Antarctic marine living resources in the area between that latitude line and the Antarctic Convergence.<sup>116</sup> Thus the CCAMLR boundaries and the Antarctic Treaty boundaries are not co-incident. Blay called inclusion of the marine ecosystem both ‘a welcome innovation and an acknowledgement of the complex relationships of Antarctic marine living resources with each other and their physical environment.’<sup>117</sup>

CCAMLR provides for the establishment of a Commission whose function is to give effect to the objectives of the Convention.<sup>118</sup> The Commission fulfils this role practically by setting total allowable catch limits in each of the CCAMLR fishing zones (Map 2, Appendix 3) for each species that may be harvested, by overseeing the inspection and observer system, and by drawing to the attention of all contracting parties any activity which affects the objective of CCAMLR, or does not comply with obligations.<sup>119</sup> CCAMLR also establishes a Scientific Committee as a consultative body to the Commission.<sup>120</sup>

Until recently, because of the inaccessibility and expense of fishing in most parts of the Southern Ocean, pressures on fish stocks were negligible or controllable because there was little to no fishing. The harvesting of krill initially was of concern, but the

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<sup>115</sup> See Fernando Zegers, ‘The Canberra Convention: objectives and political aspects of its negotiation’ in Francisco Vicuna (ed), *Antarctic resources policy: Scientific, legal and political issues* (1983) 149, 161.

<sup>116</sup> The Antarctic Convergence is a shifting, biological boundary, that is the boundary of the Antarctic Southern Ocean ecosystem; *CCAMLR* art I (1).

<sup>117</sup> S K N Blay, ‘New Trends in the Protection of the Antarctic Environment: The 1991 Madrid Protocol’ (1992) 86 *2 The American Journal of International Law* 377, 381.

<sup>118</sup> *CCAMLR*, art VII.

<sup>119</sup> *CCAMLR*, art X (2).

<sup>120</sup> *CCAMLR*, art XIV.

development of longline fishing methods (which significantly increases the capacity of the fishing industry) is now causing great concern.<sup>121</sup>

The target of the Southern Ocean fishing industry is primarily the Patagonian toothfish. Today, the toothfish fetches a price even greater than that for salmon or tuna. While it appears that the legal toothfish industry is a sustainable commercial enterprise, the toothfish industry includes an illegal element by some. The effectiveness of the CCAMLR Commission is being questioned, especially as regards the failure of the Commission to stop this illegal element. There have been many reported incidents of Illegal, Unreported and Unregulated<sup>122</sup> (IUU) fishing in the CCAMLR region. IUU fishers target toothfish outside of CCAMLR regulations, their acts jeopardize the commercial viability of the industry (and therefore threaten to close the legal fisheries), threaten to make toothfish extinct and claim the lives of thousands of seabirds as by-catch each season. Thus while it might be possible to regulate any bioprospecting in the Southern Ocean marine environment under CCAMLR, the ineffectiveness of the Commission to date may render it unable to take on any new commercial enterprise.

Academic debate has surrounded the question as to whether CCAMLR is a conservation convention or a resource regulation. The distinction may be important as it may play a role in any regulation of bioprospecting in the Southern Ocean. It currently plays a role in the decisions taken by CCAMLR state parties. The origin of CCAMLR, the political and legal context within which it was negotiated and the history of the evolution of the Antarctic Treaty System all point, according to Couratier, to CCAMLR, 'as a text designed to protect and conserve the Antarctic

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<sup>121</sup> Kenneth Bertrand, 'Operational Considerations: The Historical Background' in Gerald Schatz (ed) *Science, technology and sovereignty in the polar regions* (1974) 15, 15.

<sup>122</sup> The Food and Agricultural Organisation of the United Nations, FAO IPOA IUU (2001) defines Illegal fishing as fishing conducted in contravention of a state's laws and regulations, or relevant managements organisations and measures; Unreported fishing is defined as not reported or misreported activities; Unregulated fishing is defined as that conducted by vessels without nationality or by those flying a flag of a state not party to the management regime; See, eg, David Doulman 'Global Overview of Illegal, Unreported and Unregulated fishing and its impacts on national and regional efforts to sustainably manage fisheries: the rationale for the conclusion of the 2001 FAO International Plan of action to prevent, deter and eliminate illegal, unreported and unregulated fishing' (Paper presented at the expert consultation on fishing vessels operating under open registries and their impact on IUU fishing, Florida USA, 23-25 September 2003).

environment and not as a resource convention.’<sup>123</sup> So that any approach to a decision should begin from a conservation perspective.

CCAMLR applies to ‘the Antarctic marine living resources’<sup>124</sup> south of the Antarctic Convergence. While the definition of ‘marine living resources’ is stated to mean ‘the populations of fin fish, molluscs, crustaceans and all other species of living organisms...’ found south of the Antarctic Convergence, it is arguable whether the intention was to include micro-organisms. Micro-organisms found in the Southern Ocean include bacteria, algae and protozoa. These, along with benthic organisms, are the common targets of Antarctic bioprospectors. CCAMLR, however, pre-empted both the knowledge of microbial abundance in the Southern Ocean, and the technology necessary to exploit these organisms and the CCAMLR Preamble is evidence to support the notion that it was not the intention of CCAMLR to apply to these organisms. It was the intention of CCAMLR to conserve those living resources of the CCAMLR region that could be utilised for human consumption. The Preamble notes ‘the increased possibilities offered by the utilization of the resource as a source of protein.’<sup>125</sup> Doubt is cast, therefore, on whether application of CCAMLR as it currently stands could ever be stretched to cover conservation, including rational use, by bioprospectors of marine microbes. This point is further discussed in Part IV of this thesis.

*(d) Convention on the Regulation of Antarctic Mineral Resource Activities  
1988*<sup>126</sup>

The Antarctic Treaty does not specifically address the issue of mineral exploration and related activities. Even though mining-related activities had yet to take place in the Antarctic Treaty area, Treaty parties in the early 1970s saw that there would be a growing interest in Antarctic mineral exploration because of various factors, including the new international law of common resources and the 1970s oil crisis.

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<sup>123</sup> Josyane Couratier, ‘The regime for the conservation of Antarctica’s living resources’ in Francisco Vicuna (ed), *Antarctic resources policy: Scientific, legal and political issues* (1983) 139, 147-148.

<sup>124</sup> CCAMLR, art I.

<sup>125</sup> CCAMLR, preamble para 2.

<sup>126</sup> *Convention on the Regulation of Antarctic Mineral Resource Activities*, opened for signature on 25 November 1988, 27 ILM (1988) (not in force) (‘CRAMRA’).

Geologists agree that Antarctica was once part of the supercontinent Gondwana, which 200 million years ago began to break up into its constituent parts including Antarctica. By reconstructing Gondwana geologists have postulated the presence of significant mineral deposits in Antarctica, since some of these Antarctic regions once lay adjacent to some of today's largest and richest known mineral regions of the world. Antarctica is expected to hold similar mineral reserves.<sup>127</sup>

While there was little doubt that Antarctica would attract interest because of its mineral reserves, there was doubt, however, over the legality of mineral exploration and exploitation in Antarctica. Some believed the activity would violate the Antarctic Treaty, acting against the prejudice towards 'pure science' activities, leading inevitably to contamination of the environment, and consequently, frustrating the fundamental objectives of the Treaty.<sup>128</sup> Feasibility uncertainties surrounding the exact location, quantity and quality of the resource coupled with difficulties with extraction and uncertain economics meant that mineral exploration and exploitation had yet to take place in Antarctica.

In the context of the Antarctic Treaty System at the 1975 Consultative Meeting in Oslo, specifically considered mineral exploitation for the first time. The subsequent meeting saw guidelines put forward as Recommendation X-1, and then again as Recommendation XI-1, which provided a general framework outlining the risks that could result from permitting mineral activity on the Antarctic ecosystem and principles on which further negotiations concerning mineral exploitation might be based. These risks, coupled with the contentious territorial claims and unresolved sovereignty, did not stop the Antarctic Treaty parties from initiating discussions on a legal instrument which would allow mineral activities in Antarctica.

Sovereignty became one of the primary sticking points during negotiations. Resource exploitation (both living and non-living resources included) is normally a corollary of national sovereignty.<sup>129</sup> With sovereignty unresolved in the Antarctic Treaty region, questions surrounding resource rights would prove difficult to answer. Interests in

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<sup>127</sup> See generally, Philip Quigg, *Antarctica: the continuing experiment* (1985).

<sup>128</sup> Francesco Francioni 'Legal Aspects of Mineral Exploitation in Antarctica' (1986) 19, *Cornell International Law Journal* 163, 166.

<sup>129</sup> *Ibid*, 168.

Antarctica from third party states were also increasing at this time. Developing states were interested in any benefits derived from mineral resource exploitation; this attracted the interest of the United Nations, which the claimant states perceived as a threat to their Antarctic sovereign claims.

Ironically, the perceived threat from the United Nations to the authority of the consultative state parties (namely the claimant states) was the primary catalyst for the minerals discussions and the sense of urgency that the discussions adopted. Leaving a gap in regulations would be a temptation for other states or intergovernmental agencies to pursue the regulation of that issue. Any such outside regulation would have weakened the responsibilities on the whole of Consultative Parties, and it is said that ‘deflecting this danger constituted the underlying philosophy of CRAMRA.’<sup>130</sup>

The result was that CRAMRA was negotiated over six years and subsequently adopted in Wellington on 2 June 1988, by the 20 states that were then Consultative State parties. CRAMRA set up mechanisms for the regulation of Antarctic mineral resource activities and included complex interactions which reflected the parties’ conflicts of interests.<sup>131</sup> An Antarctic Mineral Resources Commission<sup>132</sup> and an Antarctic Mineral Resources Regulatory Committee<sup>133</sup> would have been established under the convention, whose permanent headquarters was to be established in New Zealand.<sup>134</sup>

CRAMRA required ratification by at least 16 states, including all seven of the claimant states and the US and USSR. Although all the claimant states had signalled that they would ratify the convention, just after signing France and Australia (two of the seven claimant states) announced that they would not ratify the convention. Many other claimant states, including New Zealand<sup>135</sup> then joined them by announcing that they too would not proceed with ratification. Lobbying against the convention by

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<sup>130</sup> Rudiger Wolfrum, *The Convention on the Regulation of Antarctic Mineral Resource Activities* (1991) 12.

<sup>131</sup> Watts, above n 59, 64.

<sup>132</sup> CRAMRA, art 18(1).

<sup>133</sup> CRAMRA, art 29.

<sup>134</sup> CRAMRA, art 20(5); New Zealand led the negotiations for CRAMRA.

<sup>135</sup> See eg, the press statement by the Right Honourable Geoffrey Palmer, Prime Minister, of 26 February 1990.

environmental Non-Governmental Organisations (NGOs) is credited with the change of mind by governments.<sup>136</sup> Even though a mining convention, CRAMRA did set new standards for the protection of the Antarctic environment.<sup>137</sup> Article 2, paragraph 3, set out the general principle and objective of CRAMRA being that: ‘In relation to Antarctic mineral resource activities...the Parties acknowledge the special responsibility of the Antarctic Treaty Consultative Parties for the protection of the environment...’<sup>138</sup> No mineral exploitation in the Antarctic region would have been allowed outside of the CRAMRA regime.

Many believed that CRAMRA would have established the property rights regime essential for mining to proceed – and to that extent actually ‘increased the likelihood of mining.’<sup>139</sup> The general issue of commercial information and access to data was also addressed in CRAMRA in Article 16: Availability and Confidentiality of Data and Information, reiterating the Antarctic Treaty Article III (1) (c) obligations for free availability and exchange of information, an issue that the Treaty parties must inevitably return to in the context of bioprospecting. CRAMRA made a distinction between ‘prospecting’ for minerals and the subsequent stage of ‘exploration’. The distinction was based on the concept of right.<sup>140</sup> Prospecting would not convey exclusive rights to an area while exploration might. This distinction could be applied in the context of bioprospecting whereby any ‘prospecting’ that is the process of search and discovery of novel biodiversity does not convey exclusive rights, each and every organism being made part of a freely available Antarctic database. Further phases of development of any portion of any organism found in that database, would be subject to rights, and presumably obligations, and benefit-sharing criteria, as laid down under rules or guidelines that could be developed.

CRAMRA was not, however, ratified and the Protocol now bans all mining activities, other than that associated with scientific research<sup>141</sup> in Antarctica. Nonetheless,

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<sup>136</sup> See Quigg, above n 127.

<sup>137</sup> Wolfrum, above n 130, 2.

<sup>138</sup> CRAMRA, art 2 para 3.

<sup>139</sup> Denise Boyd, ‘After the Protocol: Problems and Prospects for Antarctica’ in Julia Jabour-Green & Marcus Howard (eds), *The Antarctic: Past, Present and Future*, Antarctic Cooperative Research Centre Research Report 28 (2002) 105, 106.

<sup>140</sup> National Research Council (US) Polar Research Board ‘Antarctic Treaty System: An assessment’ (Proceedings of a workshop held at the Beardmore South Field Camp, 7-13 January 1985) 301.

<sup>141</sup> CRAMRA, art 7; No definition of ‘scientific research’ is provided.



CRAMRA remains an important part of the negotiating history of the Antarctic Treaty System and it is still considered a source of international law despite the fact that it never came into force. The principles and procedures it contains for assessing the likely impact of Antarctic-based resource-related activities have continuing relevance for other ongoing activities on the continent,<sup>142</sup> including issues related to bioprospecting. It has also been regarded by some as an important model for the future development of international law concerning the cooperation of states in the administration of areas beyond national jurisdiction.<sup>143</sup>

*(e) Protocol on Environmental Protection to the Antarctic Treaty 1991<sup>144</sup>*

Most wilderness areas of the world are protected against adverse impacts of human activities by the state that has sovereign power over them. Antarctica, as subject of disputed sovereignty, however, cannot rely on such sovereign protection.<sup>145</sup> The demise of the minerals regime, even with all its provisions for environmental protection, allowed for the consideration and development of a single environmental protection instrument for Antarctica by the Antarctic Treaty Consultative States. The adoption of the Protocol was the result and is a major step towards the comprehensive protection of the Antarctic continent. The Protocol was the outcome of the review post-CRAMRA and consistent with the rationale of establishing a single comprehensive legal instrument for the protection of the Antarctic environment.<sup>146</sup> The Protocol was negotiated relatively quickly, emerging out of three Special Antarctic Treaty Consultative Party Meetings in Chile and Spain.<sup>147</sup> On October 4, 1991 the Protocol was adopted and opened for signature in Madrid. It includes five annexes:

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<sup>142</sup> Gerard Van Bohemen and Thomas Gault, *Antarctica* (1994) 40.

<sup>143</sup> Wolfrum, above n 130, 2.

<sup>144</sup> *Protocol on Environmental Protection to the Antarctic Treaty*, opened for signature on 4 October 1991, 30 ILM (1991) (entered into force 14 January 1998) ('*Protocol*').

<sup>145</sup> See Bastmeijer, above n 57, 1.

<sup>146</sup> Blay, above n 117.

<sup>147</sup> Vina del Mar, Chile, November-December 1990; Madrid, Spain, April & June 1991.

- Annex I – Environmental Impact Assessment
- Annex II – Conservation of Antarctic Flora and Fauna
- Annex III – Waste Disposal and Waste Management
- Annex IV – Prevention of Marine Pollution
- Annex V – Area Protection and Management

These annexes were adopted on 4 October 1991 in Madrid<sup>148</sup> as a supplement<sup>149</sup> to the Antarctic Treaty. It entered into force in January 1998 and now covers human impact from all activities in the region south of 60° south latitude. The Protocol is a comprehensive approach to environmental management for Antarctica. Significantly, the Protocol prohibits all activities relating to mineral resources,<sup>150</sup> except those extracted for scientific research, and provides that this prohibition cannot be amended for at least 50 years, by less than a unanimous agreement. The Protocol builds upon the Antarctic Treaty and its associated environmental recommendations to extend and improve the Treaty's environmental protection effectiveness. Article 2 of the Protocol commits the parties to the comprehensive protection of the Antarctic environment and designates Antarctica as 'a natural reserve, devoted to peace and science.' It sets out basic principles and obligatory regulations applicable to all human activity in Antarctica, including obligations to accord priority to scientific research.<sup>151</sup>

Importantly, *all* human activities taking place in Antarctica are subject to Protocol requirements. The Protocol seeks to ensure that human activities, including those outside of national Antarctic programmes, do not have adverse impacts on the Antarctic environment, or on its scientific and intrinsic values.

The Protocol does not include rules relating to liability for environmental harm in Antarctica. Article 16 of the Protocol, however, provides for a further annex to the Protocol to be negotiated setting out rules and procedures relating to liability arising from activities taking place in the Antarctic Treaty area and which are covered by the Protocol. By providing a legal obligation for environmental damage, Antarctic Treaty parties believe that there will then be an incentive to be more cautious in the conduct

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<sup>148</sup> Annex V was adopted two weeks later on 17 October 1991 in Bonn Germany.

<sup>149</sup> *Protocol*, art 4 (1).

<sup>150</sup> *Protocol*, art 7.

<sup>151</sup> *Protocol*, art 3 (3).

of Antarctic activities. NGO groups believe that liability provisions are the only way to send a clear message that the protection of the environment is the major consideration for all human activities there<sup>152</sup> and believe that without these rules, that the comprehensive protection of the Antarctic environment will not be ensured. To date however, the negotiations on an agreement for liability continue and the issue remains as an item on the agenda of the ATCM. The ATCM's sub-group on liability, chaired by New Zealand, made further progress on the draft text at ATCM 2004. There is some hope that the liability discussions can be successfully concluded within the next two ATCMs.<sup>153</sup>

The commitment to environmental protection of the Antarctic in the Protocol is in marked contrast to the extremely limited objectives of the 1959 Antarctic Treaty. Volger notes, 'the extent of the change is reflected in the way in which norms of environmental responsibility, strict conservation and the need for precautionary action have developed and find their fullest expression in the new instrument.'<sup>154</sup>

(i) *Committee for Environmental Protection (CEP)*

The Protocol created a new institutional body to oversee compliance, entitled the Committee for Environmental Protection (CEP).<sup>155</sup> Each party to the Protocol is entitled to be a member of the CEP and is entitled to appoint a representative.<sup>156</sup> The CEP's primary function as described in Article 12(1) is to provide advice and formulate recommendations in connection with the implementation of the Protocol for consideration at ATCMs. Although intended to oversee compliance with the Protocol the CEP lacks independent capabilities including the power to enforce compliance or the issuing of sanctions; ensuring compliance is left to the states themselves. 'All attempts to create an organ with genuine law-making or law enforcement powers were blocked by those states which regarded such an establishment as a threat to their sovereignty in Antarctica.'<sup>157</sup>

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<sup>152</sup> See Boyd, above n 139, 108-109.

<sup>153</sup> Neil Gilbert, 'The 26<sup>th</sup> Antarctic Treaty Consultative Meeting (ATCM XXVI) Madrid, June 2003' in Alex Conte et al, (eds) *New Zealand Yearbook of International Law* (2004) 191, 196.

<sup>154</sup> John Vogler, *The Global Commons: A Regime Analysis* (1995) 85.

<sup>155</sup> *Protocol*, art 11 (1).

<sup>156</sup> *Protocol*, art 11 (2).

<sup>157</sup> Wolfrum, above n 130, 93.

#### 4 *Interrelationship between the Antarctic Treaty System Instruments*

The legal instruments adopted were ‘rather disparate’<sup>158</sup> so that it became necessary to consult numerous sources simply to ascertain what was the applicable or current regulation. The recent appointment of an Antarctic Treaty Secretariat should assist with this. There were also concerns regarding the relationship between successive legal instruments dealing with the same subject-matter in some cases.<sup>159</sup>

In the case of the Protocol, Article IV says that the Protocol ‘...shall supplement the Antarctic Treaty and shall neither modify nor amend that Treaty.’ The major effect of the Protocol is to supersede many of the Agreed Measures<sup>160</sup> and the environmental recommendations agreed to throughout the years.

CCAMLR and the Protocol overlap to an extent, particularly with respect to the environmental principles created by Article III of the Protocol and CCAMLR principles dealing with marine resource management. The Protocol aims for comprehensive protection of the Antarctic environment, while conservation is the primary aim for CCAMLR, the CCAMLR definition of conservation includes rational use. Some of the institutional bodies created by the legal instruments have overlapping objectives. For example, the CEP and the CCAMLR Commission’s areas of responsibility overlap as regards human activities in the CCAMLR marine zones. Arguably then, there is potentiality for institutional clashes between these competing objectives. It is this conflict that activities such as bioprospecting may exploit.

All the major legal instruments of the Antarctic Treaty System repeat the fundamental Article IV Antarctic Treaty obligations regarding sovereignty.

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<sup>158</sup> Rothwell, above n 93, 149.

<sup>159</sup> See generally, Watts, above n 59, 73.

<sup>160</sup> Gilbert, above n 101.

It should also be noted that no two of the treaties have precisely the same list of state parties (Appendix 2), so that the level of participation and obligation within the Antarctic Treaty System framework is different amongst the parties.<sup>161</sup>

## 5 *Other components*

The Handbook of the Antarctic Treaty System notes:

‘The Antarctic Treaty System also includes the results of Meetings of Experts, the decisions of Special Consultative Meetings and, at a non-government level, reflects the work of the Scientific Committee for Antarctic Research (SCAR) on all aspects of the system. These various measures and actions were adopted and taken when a need for them was perceived. The practice has been essentially pragmatic, and it was not until the conclusion of the Protocol that there was a systematic attempt to provide a code for the regulation of all Antarctic activities.’<sup>162</sup>

The importance of the availability of components such as Meetings of Experts has become increasingly apparent with the emergence of non-government expeditions to Antarctica; the most recent Meeting of Experts<sup>163</sup> involving a discussion of tourism activities in Antarctica. This device, therefore, may prove useful in the context of an activity such as bioprospecting which in most cases involves a non-governmental, commercial partner.

### *(a) Scientific Committee for Antarctic Research (SCAR)*

Under a treaty where one of the main purposes is the maintenance of freedom of scientific investigation, ‘it is fitting that there is a close relationship between science and the consultative machinery of the Antarctic Treaty.’<sup>164</sup> Often an issue is identified for which scientific advice is needed before deciding what action may be required. SCAR was established under the International Council for Science (ICSU) and although it is not formally recognised by the Antarctic Treaty, it is a highly regarded independent body with observer status at Antarctic Treaty Consultative

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<sup>161</sup> See Watts, above 59, 74.

<sup>162</sup> Cohan, above n 51, 1.

<sup>163</sup> Norway, March 2004.

<sup>164</sup> Cohan, above n 51, 3.

Meetings. SCAR's Constitution states that it is 'charged with the initiation, promotion and the coordination of scientific activity in Antarctica'. It will also formulate and provide answers to requests for scientific advice, which are then transmitted back through National Antarctic committees and Treaty governments to an Antarctic Treaty Consultative Meeting for consideration. The SCAR Constitution Guidelines also notes, however, that 'SCAR will abstain from involvement in political and juridical matters, including the formulation of management measures for exploitable resources...'<sup>165</sup> reflecting the reticence of a scientific organisation to be involved in formulating management regulations involving Antarctic natural resources, a potentially political topic.

*(b) Council of Managers of National Antarctic Programs (COMNAP)<sup>166</sup>*

COMNAP was established in 1988 to facilitate liaison between the managers of the national Antarctic agencies which are responsible for the conduct of logistics and operations in support of Antarctic-based scientific operations. COMNAP aims to enhance the conduct of scientific research, operational efficiency, safety and environmental stewardship in Antarctica. Representatives meet annually to exchange information and ideas and will occasionally, on request from ATCMs or the CEP, formulate technical advice for use within the system. COMNAP has become an active player in the international Antarctic community with an established Secretariat based in Hobart, Tasmania. Over the past ten years it has developed procedures and policy on safety, waste management and environmental protection. It may therefore have a role to play in bioprospecting discussions.

*(c) Antarctic Treaty Secretariat*

When the Antarctic Treaty was negotiated the parties did not incorporate a role for a Secretariat within the articles of that legal instrument. The absence of a permanent Secretariat, although 'surprising within the context of a modern regime'<sup>167</sup> was a deliberate omission. There was reluctance on the part of the states claiming

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<sup>165</sup> SCAR Constitution (1958), para 3.

<sup>166</sup> See [www.comnap.aq](http://www.comnap.aq) for additional information.

<sup>167</sup> Karen Scott, 'Institutional Developments within the Antarctic Treaty System' (2003) 52.2 *International and Comparative Law Quarterly* 473.

sovereignty in Antarctica to create any form of permanent administrative machinery during the Antarctic Treaty negotiations.

The discussions of a secretariat for the Antarctic Treaty began in earnest over 20 years ago, beginning with informal discussions in 1983 at ATCM XII. The primary stimulus to the discussions was the rapidly increasing complexity of the ATS, post-CCAMLR and with CRAMRA presumed to soon follow.<sup>168</sup> The task of administering mineral resources required an arrangement of far greater complexity than those created by the Antarctic Treaty.

While formal recognition of a need for a permanent secretariat was first expressed in 1985 at ATCM XIII and consensus was reached that a secretariat *should* be established<sup>169</sup> the question of location became the key point of disagreement, and that delayed the actual establishment of a secretariat for another decade. Buenos Aires, Argentina, was supported by most of the Consultative State parties as the preferred location. The United Kingdom, however, refused to support this location, in reality because of their post-Falklands/Malvinas political relationship,<sup>170</sup> but with the United Kingdom formally stating that further discussion on location was needed. In 2001, however, at ATCM XXIV, the United Kingdom announced that it would finally accept Buenos Aires as the site for the secretariat,<sup>171</sup> thereby giving the decision the unanimous support it required.

The secretariat is a constituted organ of the Antarctic Treaty. What actual level of control or influence this position will wield may not be discernable for some time. The inaugural Executive Secretary, Mr Johannes Huber, was appointed at ATCM XXVII in 2004.

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<sup>168</sup> Alan Hemmings, 'Legal issues within the Antarctic Treaty System: Institutional reform-The Antarctic Treaty Secretariat' (Presentation for the Antarctic Legal Issues Course, Christchurch, December 2002).

<sup>169</sup> XVII ATCM Final Report (1992), paras 41-51.

<sup>170</sup> Hemmings, above n 168.

<sup>171</sup> XXVI ATCM Final Report (2001).

## 6 *Consensus Decision-Making*

Article IX (4) of the Antarctic Treaty provides that measures shall become effective when approved by all contracting parties and Article XII 1(a) requires that any modifications or amendments to the Antarctic Treaty at any time may be made only ‘by unanimous agreement of the Contracting Parties whose representatives are entitled to participate in the meetings...’ This implies the right to veto and it is not, by strict definition, the same as a consensus system.

The United Nations consensus process first involves an obligation on all the parties to arrive at or attempt to arrive at an agreement by all possible means; it requires parties to act in good faith, thus entailing a positive obligation.<sup>172</sup> However, ‘the spirit which has reigned ever since the Treaty’s inception has caused this provision to be interpreted as a mechanism of consensus - and it is precisely this interpretation which has made possible all the achievements of the Antarctic System.’<sup>173</sup>

The lack of institutional provisions in the Treaty, including the lack of a Secretariat, and the consensus requirement are both indicators of the claimant states concerns over protecting their sovereignty in Antarctica. Originally this consensus system made good sense. There were 12 original signatories to the Antarctic Treaty, all of them granted consultative state party status; which included seven claimants and two others that asserted a basis of a claim. Thus, nine state signatories out of the original 12 had some ‘weight of influence, notwithstanding it is a consensus system.’<sup>174</sup> There are now, however, 27 consultative state parties and a total of 47 participating states involved in some part of the system. So that today the original signatories and those claimant states are in the minority. Also changes as to what is required to obtain consultative state status means that in a consensus system it is possible for states with little or no scientific research presence in Antarctica to frustrate the interests of ‘active’ states, this includes several original signatory states who now do little, if any, research in Antarctica but who retain their consultative status indefinitely.

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<sup>172</sup> See Zegers, above n 115, 155-156.

<sup>173</sup> Ibid.

<sup>174</sup> Anthony Press, ‘Antarctica and the Future’ in Jabour-Green and Marcus Haward (eds), *The Antarctic: Past, Present and Future* (2002) 153, 160.



The last large increase in Antarctic Treaty membership occurred in the 1980s during the time of the negotiation of minerals regime. Any discussions involving utilization of Antarctic resources, including discussions concerning bioprospecting, may see the same effect, so that there may be rekindled interest in becoming part of the Antarctic Treaty System. This raises the question of the future of consensus decision-making within the system. Most argue that while it may limit progress, that it is fundamental to the Antarctic Treaty and must be retained as the only method acceptable to a diverse range of interests. Increasing the number of signatories leads to difficulty in achieving the consensus on which the system depends.<sup>175</sup>

## 7 Summary

The Antarctic Treaty System continues to evolve. The development of institutional structures have an impact on the position of the states claiming territorial sovereignty, since such ‘internationalization dilutes their otherwise exclusive rights’<sup>176</sup> to regulate activities in their claimed territory. Even while Article IV of the Antarctic Treaty protects their legal positions, at least for the duration of that treaty, Watts argues that ‘the cumulative practical implications of any such institutional internationalisation cannot be ignored’<sup>177</sup> as it is likely to erode the territorial claimants positions.

Understanding the framework of the Antarctic Treaty System is vital to any discussions regarding the possible exploitation of Antarctic resources. It is against this background that discussions regarding the legal implications of bioprospecting in the Antarctic will be determined.

### *F History of Bioprospecting Discussions within the Antarctic Treaty System*

#### *1 Introduction*

Although bioprospecting has been occurring in the Antarctic for many years, there is no mention of ‘bioprospecting’ per se in any of the Antarctic Treaty System legal

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<sup>175</sup> Ibid 161; See also Graduate Certificate in Antarctic Studies presentation on ‘Does a consensus system make good sense today in the ATS?’ January 21 2005, Gateway Antarctica, Christchurch.

<sup>176</sup> Watts, above n 59, 87.

<sup>177</sup> Ibid, 88.

instruments. Even the Protocol, adopted as recently as 1991 and covering all human activities in the region does not specifically mention bioprospecting.

While the legal machinery of the Antarctic community appeared to be ignoring the activity, groups of Antarctic scientists recognised very early on the potential benefits from bioprospecting-related research and have been engaged, to one extent or another, in the activity ever since. To date, no one has been able to ascertain the precise nature and extent of current Antarctic bioprospecting activities.<sup>178</sup>

There have been groups from at least three Antarctic Treaty Consultative states, Australia, New Zealand and the United Kingdom, actively involved in Antarctic bioprospecting on the continent and in the marine environment since at least 1995. To date, this work has been carried out by universities, research centres and companies, all of which tend to act as part of consortia groups which are a mixture of public and private bodies.<sup>179</sup> The funding for such research also usually represents a mixture of public and private sources. One Antarctic scientist estimates that commercial private sector companies have provided \$US1 million dollars in funding from 1997 to 2004 for work on Antarctic microbiology and biotechnology.<sup>180</sup> This adds to the difficulties in distinguishing between scientific investigation and commercial investigation. Even though the groups are actively involved in Antarctic bioprospecting, no mention of bioprospecting was formally made in the context of Antarctica until 1999 when the first apparent reference to 'biological prospecting' at an Antarctic Treaty Meeting was presented in an Information Paper<sup>181</sup> tabled by SCAR at the twenty-third ATCM in Lima, Peru.<sup>182</sup>

Bioprospecting is in some cases included as research priorities in national science strategy documents. In New Zealand for example, the first Science Strategy for

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<sup>178</sup> United Nations University/Institute of Advanced Studies (UNU/IAS), *The International Regime for Bioprospecting: Existing Policies and Emerging Issues for Antarctica* (2003) 6.

<sup>179</sup> Ibid.

<sup>180</sup> Roberta Farrell, pers comm. April 2003.

<sup>181</sup> The *Antarctic Treaty* utilizes the terms 'Working Paper' and 'Information Paper' to represent ways to bring issues and points for discussion to the agenda for Antarctic Treaty Consultative Meetings. The former has the higher level of significance with only consultative state parties having the authority to present a Working Paper; while an Information Paper may be presented by any delegate but is for information purposes only and not necessarily a document which requires action amongst parties.

<sup>182</sup> SCAR 'Scientific research in the Antarctic', XXIII ATCM IP 123 (1999) 3.

Antarctica and the Southern Ocean<sup>183</sup> included not only a mention in the strategic context of the value of bioprospecting research,<sup>184</sup> but specifically referred to research into life in extreme environments ‘that supports biotech and pharmaceutical industries’<sup>185</sup> and noted that this type of research would be supported by the New Zealand government Crown Entity, Antarctica New Zealand.<sup>186</sup> This strategy has recently been replaced by the 2004-09 strategy,<sup>187</sup> which considers biodiversity research to be of fundamental importance. It makes mention of research related to biotechnology, however, only briefly stating in Theme 3: Antarctic Ecosystems Research, ‘Understanding of Antarctic biological processes such as freezing, or desiccation resistance will also provide a vital stimulus to diverse biotechnology industries.’<sup>188</sup>

SCAR’s Working Group on Biology recognised in its 1999 Information Paper under the heading of Life Science, that there appeared to be ‘no provisions in the Antarctic Treaty to deal with the exploitation of biological resources in the Antarctic...’ (with the exception of fisheries). They also noted that there had already been collections of micro-organisms in Antarctica for pharmaceutical purposes and that a biological prospecting interest was ‘developing rapidly’ in Antarctica. The implications of this growing interest was noted as a concern by the SCAR Working Group on Biology because of what they saw as the implications for science and conservation in the region, with the group agreeing to raise the issue with the SCAR and with CCAMLR.<sup>189</sup>

But it never did, and as Hemmings notes, there had been no substantive discussion of the issue in open sessions of the ATCMs, CEP or CCAMLR, or so far as anyone can

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<sup>183</sup> Antarctica New Zealand, ‘A New Zealand Science Strategy for Antarctica and the Southern Ocean’ (1988).

<sup>184</sup> Ibid, para 3.1; The Strategic Context ‘Enhancing New Zealand’s economic opportunities within the parameters of the Antarctic Treaty System’.

<sup>185</sup> Ibid, para 5.3; Theme 3, Life in Extreme Environments: ‘Understanding of Antarctic biological processes...will also provide a vital stimulus to diverse biotechnology industries’; Theme 3A: Biodiversity and Environmental Change: ‘Research into biodiversity...is of potential value to fishing, agriculture, aquaculture, medical and pharmaceutical industries’.

<sup>186</sup> The New Zealand Antarctic Institute Act 1996, s 5 (a).

<sup>187</sup> Antarctica New Zealand, ‘New Zealand Science in Antarctica and the Southern Ocean (2004-2009)’ (2004).

<sup>188</sup> Ibid, 24.

<sup>189</sup> Ibid, 3-4.

tell, in any of the closed sessions of the Heads of Delegations.<sup>190</sup> The limited discussions that have taken place to date within the Antarctic Treaty System are presented below.

### *G Discussions within the Antarctic Treaty System*

It was not until the XXV Antarctic Treaty Consultative Meeting in Warsaw, Poland, in September 2002, that bioprospecting appeared as an issue for discussion and as the subject of specific formal papers. At the CEP meeting, a week prior to the Consultative Meeting, the United Kingdom presented Working Paper 43.<sup>191</sup> This Working Paper noted in its paragraph 3: ‘Significant value is particularly attached to bioprospecting in special habitats...increasingly, the Polar Regions. Accordingly, Antarctica is far from immune to the considerable expansion of bioprospecting.’<sup>192</sup>

The Working Paper was of the opinion that bioprospecting was a matter in which pre-emptive discussion and decision-making was required, saying ‘ground-rules need to be put in place before this activity gains a momentum of its own.’<sup>193</sup> Today it might be argued that it now has such momentum.

The Working Paper also highlighted three issues that the United Kingdom believed warranted particular attention:

1. The conflict between confidentiality that surrounds commercial exploitation of biological materials and the free exchange of information provision mandated by Art III of the Antarctic Treaty.
2. Regulation of bioprospecting and related activities.
3. Regulation in respect of revenues derived from commercial exploitation of an Antarctic species.

The CEP V Final Report notes that state delegates accepted that the issue required further discussion and some noted that the issues were ‘complex and included legal

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<sup>190</sup> See Alan Hemmings, ‘A Question of Politics: The Role of the Antarctic Treaty System’ in Alan Hemmings and Michelle Rogan-Finnemore (eds) in *Antarctic Bioprospecting* (2005) (in press).

<sup>191</sup> United Kingdom, ‘Biological Prospecting in Antarctica’ XXV ATCM WP 43 (2002).

<sup>192</sup> *Ibid* 2.

<sup>193</sup> *Ibid* para 11.

and political issues' that were beyond the 'environmental brief' of the CEP. Several of the NGO observers, including the Antarctic and Southern Ocean Coalition (ASOC) representatives stated their concern that bioprospecting 'would represent a further penetration of commercial and economic interests into Antarctica...' and argued that bioprospecting should not be accepted as a 'fait accompli.'<sup>194</sup> This is interpreted to mean that just because bioprospecting activities are currently underway in the Antarctic, it does not necessarily mean that we should accept that this is so; but we should consider all options for regulation and management, including a moratorium on bioprospecting activities in the region.

The CEP concluded that additional discussions were needed, but it was suggested that consideration was required by the Consultative states at the ATCM itself. The final report of the ATCM in paragraph 68 notes that the ATCM agreed with the CEP that biological prospecting was a very important matter which raised legal and political issues, as well as environmental issues. Members were encouraged to investigate the issues and options and prepare papers for the 2003 ATCM and CEP VI (2003).

At the same time SCAR prepared a Working Paper<sup>195</sup> that it had intended to present at the 2002 Warsaw ATCM. This paper was withdrawn before the meeting and so was never formally discussed. The reasons for its retractions remain unclear, suppositions include unsatisfactory SCAR sign-offs on the document, arguments that the paper went beyond SCAR's scientific brief into policy areas, and suggestions that a key state player in Antarctica may have been unhappy with any proposal that involved the operations of the Convention on Biological Diversity (CBD) in Antarctica.<sup>196</sup> In the paper, SCAR specifically recognises the value of the CBD to the conservation and sustainable management of Antarctic flora and fauna. In paragraph 10, SCAR goes as far as to recommend that the Antarctic Consultative State parties consider accepting the application of the appropriate articles of the CBD for the Antarctic through a measure.<sup>197</sup> Which articles thought appropriate by SCAR were not listed. A discussion of the CBD is presented later in this thesis.

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<sup>194</sup> Hemmings, above n 190, point 7 under ASOC issues.

<sup>195</sup> SCAR, 'Convention on Biological Diversity for ATCM – Antarctic biodiversity' XXV ATCM WP 24 (withdrawn) (2002).

<sup>196</sup> Hemmings, above n 190.

<sup>197</sup> SCAR, above n 195, para 11.

In November that same year, CCAMLR XXI was held in Hobart, Tasmania. Item 13.14 of the Final Report from that Meeting<sup>198</sup> noted that the Chair of the CCAMLR Scientific Committee participated in CEP V and he noted that an important issue of relevance to CCAMLR included, inter alia, the complexity of biological prospecting in Antarctica.

Several Consultative States, including New Zealand, began discussions on the issue to prepare Information Papers for ATCM XXIV held in Madrid in July 2003. However, only two papers concerning bioprospecting were actually tabled at the CEP VI (2003) meeting. The first Information Paper, IP 47, tabled by New Zealand was the outcome from the Gateway Antarctica Academic Workshop on Bioprospecting in Antarctica held in April 2003.<sup>199</sup> The paper, tabled by the New Zealand delegation with the disclaimer that it did not necessarily reflect the views of the New Zealand government, addressed issues of supply, environment, equity and ethics as well as the legal and political difficulties surrounding Antarctic bioprospecting. The Legal Working Group from the Workshop, chaired by Mansfield and including international law experts such as Rothwell, was of the view that bioprospecting ‘per se appears not to pose legal issues in relation to Article III of the Antarctic Treaty’.<sup>200</sup> This was the conclusion from the group after a full discussion of intellectual property rights, particularly patenting, in the context of Antarctic-derived materials. The legal group reported that ‘benefit-sharing’ was the most significant issue, but that there was no benefit-sharing mechanism within the Antarctic Treaty System. Both of these points will be considered later in this thesis.

The second Information Paper simply entitled ‘Bioprospecting’,<sup>201</sup> tabled by the UK (jointly with Norway), written by academics at the United Nations University in Tokyo and accompanied by a disclaimer similar to that of the New Zealand paper, included a review of bioprospecting activities in Antarctica and worldwide. The paper also went on to discuss the relevance of the CBD to Antarctic bioprospecting, saying it ‘contained the pre-eminent standards for bioprospecting and may apply to

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<sup>198</sup> CCAMLR, ‘Final Report of CCAMLR XXI’ (2002).

<sup>199</sup> New Zealand ‘Bioprospecting in Antarctica: An Academic Workshop’ XXIV ATCM IP 47 (2003).

<sup>200</sup> See Legal Workgroup Report, Bioprospecting in Antarctica Workshop, April 2003.

<sup>201</sup> United Kingdom and Norway, ‘Bioprospecting’ XXVI ATCM IP 75 (2003).

some extent to bioprospecting activities in Antarctica...especially in the context of the fair and equitable sharing of benefits which may arise from the use of biological resources'.<sup>202</sup>

Information Paper 75 cites various and numerous conclusions, raised questions and raised or supported points that were previously raised, that required in-depth consideration. Most relevant amongst these are:

1. That the absence of regulations in Antarctica may increase bioprospecting;
2. Controlling the use of genetic resources in Antarctica needs to take account of the complex jurisdictional issues raised by Article IV of the Antarctic Treaty and the different legal regimes relevant to the Southern Ocean;
3. Features of CRAMRA's provisions regulating mineral resource activities and its treatment of data and information that have potential commercial value may be of particular relevance;
4. Is bioprospecting contrary to Article III of the Antarctic Treaty?

Both of the Information Papers were received by the CEP and ATCM, however, the discussions were once again delayed until 'a future ATCM'. No reason for a delay was given, however a delegate to the CEP notes that the legal and political issues surrounding this activity may simply be too hard for the Consultative State parties to contemplate at this time.<sup>203</sup>

A third paper was presented by Chile.<sup>204</sup> The paper drew on principles in an earlier Chilean Working Paper<sup>205</sup> tabled in 1989 which had addressed 'comprehensive measures for the protection of the Antarctic environment' and suggested that the effects of any activity had to be considered in the context of potential effects on the ecosystem as a whole, including any bioprospecting-related activity. Hemmings seems to think this was a call for application of the 'precautionary principle' to

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<sup>202</sup> Ibid para 92.

<sup>203</sup> Hemmings, pers. comm., referring to a colleague who wished to remain anonymous.

<sup>204</sup> Chile, 'Notes on bioprospecting and Antarctic research' XXVI ATCM (2003); Hemmings defines it as a 'non-paper' which he takes likely to mean that the thoughts therein were of an informal nature and should not necessarily be taken as representing the position of the state.

<sup>205</sup> Chile, 'Working Paper submitted by the delegation of Chile' XV ATCM WP 7 (1989).

bioprospecting.<sup>206</sup> It also looked at the possible roles of other existing legal instruments, both internal and external (including, inter alia, the CBD, the Agreement on Trade-Related Aspects of Intellectual Property Rights<sup>207</sup> and the Bonn Guidelines<sup>208</sup>) to assist in the regulation of bioprospecting in Antarctica.

There was no further discussion of bioprospecting at the Madrid ATCM in 2003. The ATCM Final Report mentions bioprospecting once, in the context of the CEP: ‘The CEP discussed the issue of biological prospecting in Antarctica and noted that there are many complex legal and political issues that should be considered by a future ATCM.’<sup>209</sup> The vagueness of ‘a future ATCM’ could not be taken to necessarily mean the next meeting, which was to be in 2004. However, item 17 ‘Biological Prospecting in Antarctica’ did appear in brackets on the preliminary agenda for XXVII ATCM in South Africa as a possible item for inclusion.

No substantive discussion of bioprospecting took place at the CCAMLR XXII in October - November 2003. Only the CCAMLR executive secretary’s ATCM report<sup>210</sup> considered bioprospecting and included in the ‘main points of direct relevance to CCAMLR...the issue of biological prospecting in Antarctica’.<sup>211</sup> The only other comment recorded in the Report of the Commission was the observation by Norway that bioprospecting ‘would involve complex political and diplomatic issues’.<sup>212</sup>

### *1 The most recent Antarctic Treaty Consultative Meeting*

At ATCM XXVII held in South Africa in May 2004, bioprospecting was briefly discussed at the CEP Meeting. No substantive discussions took place. One Information Paper<sup>213</sup> was presented by the United Nations Environment Programme<sup>214</sup> (UNEP). This paper is essentially a ‘survey of relevant activities in Antarctica,

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<sup>206</sup> Hemmings, above n 190.

<sup>207</sup> *Agreement on Trade-Related Aspects of Intellectual Property Rights*, opened for signature on 15 April 1994, 1869 UNTS 229 (entered into force 1 January 1995) (‘*TRIPS Agreement*’).

<sup>208</sup> *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*, COP VI Decision VI/24 (‘*Bonn Guidelines*’).

<sup>209</sup> Final Report of CEP VI, paras 171-179.

<sup>210</sup> CCAMLR Executive Secretary ‘Report of the CCAMLR Observer to ATCM-XXVI’ CCAMLR-XXII/BG/5 (2003) para 22.

<sup>211</sup> CCAMLR ‘Report of the Twenty-Second Meeting of the Commission’ (2003) para 13.2 (viii).

<sup>212</sup> *Ibid* para 13.7.

<sup>213</sup> UNEP ‘Industry Involvement in Antarctic Bioprospecting’ XXVII ATCM IP 106 (2004).

<sup>214</sup> UNEP has expert status at ATCM and CEP meetings.



research programmes most directly involved, and records of the appropriate patent offices.’<sup>215</sup> It was written by the authors of the United Nations University Information Paper. It concludes that while patents have been taken based on Antarctic-related organisms, products and processes have not yet been commercialised. It is also noted in the paper’s conclusion that ‘companies have not made it a priority to focus their attention on Antarctic samples, as the cost, risk and time involved do not concur with the necessity to generate marketable products.’<sup>216</sup> The paper, while a useful start to investigating the level of activity that surrounds Antarctic bioprospecting does not directly support a debate on the legal implications of allowing the activity to continue in Antarctica. After presentation of the paper, there was still no substantive debate on the legal aspects of Antarctic bioprospecting at the meeting.

The report from CEP VII (2004) and the Final Report from ATCM XXVII (2004) each refer to bioprospecting only once. CEP Report, item 7 ‘Biological Prospecting’ says:

‘UNEP introduced ATCM XXVII/IP106 *Industry Involvement in Bioprospecting*, noting the level of commercial use is limited, that no commercial product has been developed so far, but nevertheless that a significant amount of research is of commercial interest. Germany noted that the issue was important and that the CEP needed to address the issue in a more detailed manner than it has so far.’

The Final Report from ATCM XXVII refers in its Paragraph 17 *Biological Prospecting in Antarctica*, stating:

‘The representative from UNEP gave a short introduction to its Information Paper 106 on industrial involvement on Antarctic bio-prospecting. A number of parties emphasised the increasing importance of this topic for the ATCM and urged interested delegations to introduce Working Papers at XXVIII ATCM, so that consideration of this important subject can progress. The need for the ATCM to be informed of developments on this topic in other international fora was stressed.’

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<sup>215</sup> UNEP, above n 213, 3.

<sup>216</sup> Ibid 19.

## 2 Summary

Discussion regarding bioprospecting in the Antarctic have begun within the Antarctic Treaty System, but these discussions have been progressing slowly. Perhaps this is a reflection of other important discussions that have taken place, and therefore taken time, regarding the establishment of an Antarctic Treaty Secretariat and recently the discussions involving tourism in Antarctica. It may also be a reflection of deeper concerns involving, *inter alia*, resource management in areas beyond national jurisdiction, the ramifications of the CBD and tensions between any commercial use of Antarctica and the primacy awarded to science. The most recent ATCM contained little in the way of discussion on the topic and only one Information Paper was presented, authored not by a Consultative State but by UNEP, an organization with expert status. This may reflect the reluctance of Antarctic Treaty states to begin substantive discussion on an issue that may become as contentious as the minerals debate of the 1980s.

The Antarctic Treaty legal system, an administrative unit which prides itself on being proactive and pre-emptive to regulate and therefore protect the Antarctic environment when faced with emerging challenges, arguably has, on this occasion, failed to recognise and regulate (or prevent) an activity that has already resulted in the patenting worldwide of more than 40 patents that rely on Antarctic flora and fauna<sup>217</sup> and an estimated 92 patent applications that refer to Antarctica in the US Patent Office.<sup>218</sup>

The recognition of the usual proactive approach of the Treaty System was stated in a recent SCAR Working Paper: 'To date it has been a hallmark or aspiration of the Treaty parties to regulate...for such issues ahead of them becoming a commercial reality (witness the proactive approach taken by the parties in respect of for example, CCAS and CCAMLR).'<sup>219</sup> SCAR suggests that the reason for doing so is so that 'the issues...can be debated without the pressures of commercial vested interest intervening.'<sup>220</sup> In this case the parties appear to be failing, they simply do not

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<sup>217</sup> Gary Stix, 'Patents on ice', *Scientific American* (USA), May 2004, 26.

<sup>218</sup> United Nations University/Institute of Advanced Studies, above n 178, 7.

<sup>219</sup> SCAR, above n 195, para 10.

<sup>220</sup> *Ibid.*

consider bioprospecting to be a pressing issue at this time or the issue is too difficult to tackle right now or the expertise necessary to fully consider the issues is not available. This failure may also be a reflection of the closeness of the issue to the scientific community, to scientific research and to the National Antarctic programmes themselves. That is, bioprospecting in the Antarctic has principally been an internally generated activity, an outgrowth of science undertaken *within* National Antarctic programmes. In that way, it is different from other commercial activities, as they take place outside of these state programmes and are non-governmental activities. This could mean that since at least some of the members of National Antarctic programmes have a vested interest in at least some phases of bioprospecting, there may be fewer champions for response measures than seen in the past with other ‘outside’ activities.<sup>221</sup>

#### *H Definitions proposed within the Antarctic Treaty System*

An Antarctica New Zealand internal paper on bioprospecting written by their science strategy manager, defined bioprospecting as: ‘the search for commercially valuable biochemical and genetic resources in plants, animals and organisms.’<sup>222</sup>

This paper also goes on to note that:

‘these resources may be used in food production, pest control, the development of new pharmaceuticals and other biotechnology applications. The key distinguishing feature from other biotechnology research is the concept of ‘prospecting’ – the search of biological material for as-yet undiscovered substances and applications. It is normally a targeted search for a certain end use.’<sup>223</sup>

The paper identified several key questions for consideration associated with bioprospecting in Antarctica, including:

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<sup>221</sup> Hemmings (pers comms), February 2005.

<sup>222</sup> Dean Peterson, *Bioprospecting in Antarctica*, Antarctica New Zealand Internal Paper (October 2001), 1.

<sup>223</sup> Ibid.

1. Should the New Zealand government have a policy on bioprospecting in Antarctica?
2. Should New Zealand benefit from bioprospecting? If not who should?
3. Is the protection of intellectual property gained from scientific investigations consistent with the Antarctic Treaty? Should the issue of bioprospecting and intellectual property from Antarctic research be discussed at an Antarctic Treaty Consultative Meeting?
4. What are the costs, benefits and risks associated with bioprospecting? Should the benefits be negotiated between New Zealand research institutions and international collaborators privately?<sup>224</sup>

The paper was never discussed in the context of the Antarctic Treaty System; it was purely an internal paper for the use of Antarctica New Zealand staff and its board members. It was released in response to a request under the Official Information Act.

In the context of the Antarctic Treaty fora, Working Paper 43 tabled by the UK at ATCM XXV in Madrid (July 2003) was the first formal Antarctic Treaty paper to attempt a definition of the term bioprospecting. It states, 'biological prospecting (or bioprospecting) is: The exploration of naturally occurring micro-organisms, plants and animals for commercially valuable genetic and biochemical resources.'<sup>225</sup> The definition then continues to highlight the fact that the practice has been around for many years, with applications being found to support increased food production, regulate disease and pests, and in a variety of medical applications.

A New Zealand-based researcher, who has been involved in looking at the chemistry of Antarctic flora and fauna for many years, defines bioprospecting as 'a description of the process of discovery of a new lead structure with biological potential from a natural resource.'<sup>226</sup>

The reference to any sort of 'prospecting' especially in the context of Antarctica inherently includes the perception of exploitation<sup>227</sup> and with it, pollution or

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<sup>224</sup> Ibid 2.

<sup>225</sup> United Kingdom, above n 191.

<sup>226</sup> Munro, above n 27.

<sup>227</sup> Farrell and Duncan, above n 25, 2.

degradation of the environment. Prospecting was specifically referred to and defined within CRAMRA<sup>228</sup> and so any reference to the word may carry an echo of the complexity and issues surrounding a minerals regime for Antarctica. However, the environmental management and protection of the Antarctic environment is, at least for the moment, now adequately regulated by the Protocol and in some cases bioprospecting collection requires a sample so small it can be collected by merely wiping a sterile swab onto the collection target.<sup>229</sup>

### *I Fundamental considerations towards an adequate definition*

The discussions regarding Antarctic bioprospecting also involve distinguishing the activity primarily as scientific research or as one of commercial activity. An activity that is considered scientific research is a legitimate activity in the Antarctic according to the Antarctic Treaty. While there are at least two legal activities (tourism and fisheries<sup>230</sup>) currently taking place in the Antarctic that can be labelled commercial, commercial activities in the Antarctic are generally perceived as being outside or contrary to the objectives of the Antarctic Treaty. The discussions surrounding commercial activity in the Antarctic will be considered in some detail later in this thesis; there are divergent views depending on one's perspective as to whether bioprospecting should be treated just as any other scientific research activity in the Antarctic or be seen as an emerging commercial activity. The opinion of at least one academic sums up the difficulty when saying that the present form of bioprospecting:

‘the taking of samples of genetic material for further research cannot be compared with the exploitation and depletion of marine living resources as occurs in fishing activities. Since the collection of the samples for the sake of their genetic resources is not concerned with the mass of the material but rather with the further research on its content, the activity, [genetic sample collection], although highly commercial, resembles scientific research.’<sup>231</sup>

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<sup>228</sup> CRAMRA, arts 1(8), 37, 38.

<sup>229</sup> Farrell and Duncan, above n 25, 2.

<sup>230</sup> This does not include those activities which are attributable to IUU fishing.

<sup>231</sup> Nele Matz ‘The interaction between the Convention on Biological Diversity and the UN Convention on the Law of the Sea’ in Peter Ehlers, Elisabeth Mann-Borgese and Rudiger Wolfrum (eds), *Marine Issues: from a Scientific, Legal and Political Perspective* (2002) 203, 210.

This distinction becomes important for any discussion regarding the legitimacy of allowing the activity in the Antarctic Treaty region. While different publications may agree on the ‘essence of what bioprospecting is’,<sup>232</sup> and while it is not difficult to see for oneself what the necessary steps are in the process, sources differ on the exact definition and on how far ‘bioprospecting extends down the path toward commercialisation’.<sup>233</sup> In many cases there is no prospect of utilising the bioprospected material in any commercialisation.

For the purposes of this thesis, a modified version of the definition stated in the Australian bioprospecting document shall be utilised. That is, bioprospecting is herewith defined as: the search for valuable chemical compounds and genetic materials from plants, animals and micro-organisms; the extraction and testing of those compounds and materials for biological activity; and the research and commercial development of those that show activity. This definition is inclusive of all phases of the process from search and discovery through to any commercial development.

This broad definition has been adopted so that the legal implications of all phases of the activity may be considered. The definition reflects the fundamental importance of ‘the search’ which is the phase of the activity which is undertaken within the Antarctic region. The definition also captures the many stages in any bioprospecting process and critically it includes any work on an isolated compound or material extracted from Antarctica that may be commercially developed. The inclusion of the commercial development stage of the process is an important legal consideration even though this stage does not take place in the Antarctic region itself and is currently subject only to regulation under relevant domestic policy and guidelines.

### *J Environmental Impact*

As mentioned the inherent implication in the concept of prospecting, is that the activity is a threat or potential threat to the Antarctic environment. Like many

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<sup>232</sup> International Union for the Conservation of Nature (IUCN), ‘Bioprospecting Marine Resources’ (Information Paper presented at the Seventh meeting of the Conference of the Parties to the Convention on Biological Diversity (COP7), Kuala Lumpur, Malaysia, 9-20 February 2004) 4.

<sup>233</sup> Ibid.

extractive activities, bioprospecting has the potential to cause harm to the environment. The harm may come from over-collecting that is, taking too much of one species, or taking a species which is slow to grow and therefore slow to recover; the introduction of exotic species into the relatively pristine Antarctic environment; mis-collecting, that is, the use of inappropriate collection methods that result in damage to habitats or species other than those that are actually being targeted for collection; or simply accidental interference with, or destruction of, one or more species.

Proponents of the activity maintain however, that bioprospecting usually only involves the collection of a small amount of a species. There are arguments whether this is true in fact, as some believe that reports by researchers are inaccurate and that the reality may be that collection processes are poorly documented and confidentially agreements that are common for such surveys complicate access to information.<sup>234</sup> Regardless of the amount, the sample is then put through a range of clinical tests to determine its usefulness. If the test indicator is positive for a bioactive compound, the compound can usually be synthesised and this synthetic clone of the original then used for the remainder of the testing. If successful, it is the clone that will be mass produced to commercial specifications.

Existing Antarctic Treaty System legal instruments address environmental impacts that may result from first generation bioprospecting, that is, probable impacts from ordinary sample collection. Second generation, ex-situ bioprospecting has no additional impact on the environment as the compound that is isolated to undergo clinical trials was extracted from Antarctica for another purpose, has been researched and investigated for that specific purpose and has been discarded by its original extractor. If proven during initial trials to be bioactive, then it too will be synthesised for further testing and possible production. The second generation bioprospecting, while an environmentally sound practice, raises its own unique issues around intellectual property rights and benefit-sharing, discussed later in this thesis.

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<sup>234</sup> United Nations University/Institute of Advanced Studies, above n 178.

### *K Impact on Intrinsic Value of the Antarctic Region*

In the 1980s a dilemma existed between claimant and non-claimant states, between member states in favour of commercial activities and those in favour of conservation, and between Antarctic Treaty Party states and external states. All the Antarctic Treaty Party states eventually awarded top priority to conservation. The question then became how best to achieve their conservation goal. In the end, conservation was achieved by rejecting CCAMRA and adopting the Environmental Protocol.<sup>235</sup>

The Protocol includes protection of a new value for Antarctica. Reflected in its environmental principles section it states:

‘The protection of the Antarctic environment and dependent and associated ecosystems and the intrinsic value of Antarctica, including its wilderness and aesthetic values...shall be fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area.’<sup>236</sup>

The inclusion of protection of the ‘intrinsic value’ of Antarctica is a reflection of a shift in contemporary international law. Birnie and Boyle explain that:

‘in the early development of environmental law, the focus was that of anthropogenic motivation, most notably in attempts to develop a new human right to a decent environment...more recently, the inclusion of protection of ethical considerations such as intrinsic values, of a place or of biodiversity inter alia, reflects a growing ecocentric perspective, that can lead on to a rather different vision of respect for the world.’<sup>237</sup>

While it can be seen that the intrinsic value of the area must be considered, what this actually means in practice in the context of the Antarctic region is still unclear. Since protection of this value is a recent inclusion in the Antarctic Treaty System, it has not yet been tested or challenged. Usually, intrinsic value recognises the right of something to exist for its own sake, not as a means to complete a goal.

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<sup>235</sup> See van der Lugt, above n 8.

<sup>236</sup> *Protocol*, art 3(1).

<sup>237</sup> Patricia Birnie and Alan Boyle, *International Law and the Environment* (2<sup>nd</sup> ed, 2002) 5-6.



So that while the Protocol states that all human activities in the Antarctic Treaty region are subject to its strict environmental criteria and while the Protocol preserves the priority afforded to science in the Antarctic Treaty area above all other activities on the continent, this new reference to protection of intrinsic values of the region, if upheld in practice, may prove to be a barrier to some forms of activities including, arguably, some forms of science which appear to impact upon this value, or commercial activities. This may be an issue which requires consideration in the context of bioprospecting.

Outside the context of Antarctica, the concept is also reflected generally as regards the use of biological materials. For example, Dyer notes:

‘Rather than seeing only the economic potential of biotechnological manipulation of nature for the purpose of human development, a “green theory” of value, for example, would suggest that nature is valued for its naturalness, and so any kind of intervention is devaluing and a threat to the environment.’<sup>238</sup>

Bioprospecting activities in the Antarctic region may therefore present the first challenge under the Protocol in regard to protection of its intrinsic value. So that it may attract attention or even criticism from the global community that is currently arguing for protection of the ‘naturalness’ of the global biological environment.

#### *L Current Levels of Bioprospecting Activity in the Antarctic*

Research into Antarctic biodiversity remains relatively low and the knowledge base that biotechnology companies require in order to begin their expensive bioprospecting-related investigation has not been sufficiently developed. The biodiversity research efforts in the Antarctic to date have focused particularly on the marine environment of the Southern Ocean.

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<sup>238</sup> Hugh Dyer, ‘Biotechnology and international relations: the normative dimensions’ in Alan Russell and John Vogler (eds) *The international politics of biotechnology, investigating global futures* (2000) 30, 30.

As mentioned previously, the most recent Information Paper focussing on bioprospecting was a ‘survey of the relevant activities in Antarctica, the sectors using genetic material from Antarctica [and] research programmes most directly involved.’<sup>239</sup> Table 1 (below) contains a summary of the companies mentioned in that Information Paper. The table refers to consortia here defined as public-private arrangements. The Information Paper implies that such collaborative arrangements conceivably will become more attractive in the future. No explanation of the consortia nomenclature is given in the Information Paper, but it appears there are at least five such groups engaged in Antarctic-related bioprospecting activities.

<b>Company</b>	<b>Registration</b>	<b>Consortia</b>
Cerylid Biosciences	Australia	CRC
Genencor International	International	Micromat
Merck Sharp & Dohme	Spain	Micromat
PharmaMar	Spain	UC
Reckitt-Benckiser	UK	UK
Unilever	Netherlands	IC
Unilever	UK	
Vicuron	Italy	Micromat
<b>University</b>		
Bath University	UK	UK
Bordeaux University	France	Micromat
DSMZ	Germany	Micromat
Imperial College London	UK	IC
Nevada University	United States	
University of Auckland	New Zealand	
University of Canterbury	New Zealand	UC
University of Ghent	Belgium	Micromat
University of Liege	Belgium	Micromat
University of Nottingham	UK	Micromat
University of Tasmania	Australia	CRC
Waikato University	New Zealand	UK
<b>National Antarctic Programme</b>		
Antarctica New Zealand		
Australian Antarctic Division		
British Antarctic Survey		
United States Antarctic Program		

**Table 1:** Organisations identified in ATCM XXVII IP-106 (2004) as either currently or recently engaged in activities related to Antarctic bioprospected materials.

<sup>239</sup> United Nations University/Institute of Advanced Studies, above n 178, 3.

The general conclusion from the Information Paper survey was that

‘scope for development exists...however, current constraints on the industry mean that there is not currently a priority to focus on Antarctic samples. While patent applications reflect a high level of interest at the opening of this “new frontier”, industry has reduced their level of involvement due to an underdeveloped knowledge base and uncertainty regarding sample ownership and intellectual property rights.’<sup>240</sup>

We may never be able to ascertain the level of bioprospecting activity and the results of that activity to date. We should however begin to collect data from researchers beginning with the upcoming Antarctic research season.

#### *M Summary*

While activities related to bioprospecting are underway in the Antarctic region, a definition of the activity has not been agreed upon internationally and has not yet been developed for the Antarctic region. Breaking down the activity into phases may help in understanding the activity itself, but it does little to contribute to any discussions regarding commercialisation in the Antarctic region and it does not help arguments regarding rights to Antarctic resources. While a comprehensive definition is clearly needed, it may be difficult for the Consultative State parties to reach consensus on a definition, as national definitions of the activity vary or in some cases bioprospecting has yet to be considered domestically. However, the first step in the regulation of this activity in the Antarctic will be for the parties to agree on a definition. Once the activity is defined, extent of the activity to date and results produced to date should be surveyed, perhaps through SCAR.

While bioprospecting appears to involve little environmental impact, there are always possible impacts associated with any human activity in Antarctica. Therefore, the search and collection phase may well involve impacts that are more than minor or transitory. The notion of protection of the intrinsic value of the Antarctic has yet to be

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<sup>240</sup> Ibid 19.

tested. It is unclear what this obligation entails nor even if it implies any obligation in practice. If the intrinsic value of Antarctica means simply that Antarctica should be protected from adverse environmental impacts, then most activities in Antarctica may continue. If however it means that Antarctica has value simply by its very existence and that no direct interference with the place should be allowed, no human activity, including bioprospecting, would be permitted in the Antarctic region. It is doubtful that this idea will ever formerly be debated within the Antarctic Treaty arena at least in the near future.

## II LEGAL IMPLICATIONS OF BIOPROSPECTING IN THE ANTARCTIC: USE OF THE ANTARCTIC FOR PEACEFUL PURPOSES ONLY AND THE FREEDOM OF SCIENTIFIC INVESTIGATION

### A Introduction

The principles of the Antarctic Treaty System are often debated. Most would agree that the Antarctic Treaty, the founding document of that system, lays down at least two fundamental legal obligations, which are:

1. Peaceful use of the Antarctic Treaty region; *and*
2. Freedom of scientific investigation and co-operation toward that end, in the Antarctic Treaty region.

Part II of the thesis concentrates on these two fundamental legal obligations of the Antarctic Treaty. Other scholars include a third obligation, that is, the obligation to compromise on sovereignty in the Antarctic.<sup>241</sup>

In addition to the obligations established by the Antarctic Treaty, the recently enacted Protocol lays down a further fundamental obligation for all signatory parties, the obligation to actively protect the Antarctic environment. This obligation is particularly evident in the access and reporting requirements found in Annex I of the Protocol.<sup>242</sup>

The broad question to be considered in this part of the thesis is, does allowing or conducting Antarctic bioprospecting infringe the Treaty obligations of peaceful purposes and freedom of scientific investigations? Answering this question requires consideration of Articles I, II and III of the Antarctic Treaty. The discussions surrounding the sovereignty compromise obligation and the environmental obligation will be discussed in Parts III and IV of this thesis, respectively.

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<sup>241</sup> See R Tucker Scully 'The Antarctic Treaty System as a System' in Richard Herr, Robert Hall and Marcus Howard (eds) *Antarctica's Future: Continuity or change?* (1990) 95; See also Loraine Elliott, *International Environmental Politics: Protecting the Antarctic* (1994) 35-38.

<sup>242</sup> *Protocol*, Annex I Environmental Impact Assessment.

### *B Article I Antarctic Treaty: Peaceful Purposes Obligation*

From the start of the negotiations of the Antarctic Treaty, the ‘peaceful use’ of Antarctica constituted the fundamental objective.<sup>243</sup> The inclusion of such an objective was motivated by a desire to retain Antarctica’s non-militarised status in the context of the fear of the spread of the Cold War.

The Preamble to the Antarctic Treaty states that the governments of the signatory parties recognise ‘that it is in the interest of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes...’<sup>244</sup> This preamble statement reflects Article I, paragraph 1, of the Antarctic Treaty which states that, ‘Antarctica shall be used for peaceful purposes only.’ The Antarctic Treaty has thus ensured the use of the continent for peaceful purposes only, at least as regards the current 45 signatory states.

What peaceful purposes specifically means, and more importantly what it practically does, is not defined within the Antarctic Treaty System. Even in 1959, the phrase was ‘clouded in ambiguity’<sup>245</sup> and the parties devoted little time in their discussions to its precise meaning. In a strict sense a ‘peaceful purpose’ carries with it a negative connotation. That is, ‘let’s not do anything with a military purpose in the region.’ This interpretation made sense in 1959 when the Antarctic Treaty was negotiated and signed, as the United States in particular did not wish to see the Cold War spread into the Antarctic region. Some go so far as to cite Antarctica under the Antarctic Treaty as the first successful attempt at regional disarmament. This is, in fact, misleading for two reasons. First, Antarctica never hosted established military bases, although the majority of the original Antarctic stations were indeed set up by military personnel from the original signatory countries. So that there was, in fact, nothing to disarm. Secondly, others have argued that while the peaceful purposes objective gives the perception that it demilitarised Antarctica it does not in fact do so,<sup>246</sup> as there is still a military presence as such in Antarctica as many national Antarctic research programmes utilize military personnel to support their operations. The objectives of

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<sup>243</sup> Peter Beck, *The International Politics of Antarctica* (1986) 70.

<sup>244</sup> *Antarctic Treaty*, preamble para 1.

<sup>245</sup> Beck, above n 243, 70.

<sup>246</sup> See Alan Hemmings, ‘Is Antarctica Demilitarised?’ in Richard Herr, Robert Hall and Marcus Haward (eds), *Antarctica’s Future: Continuity or change?* (1990) 225.

these operations, however, are non-military - they are there to provide science logistics support.

While the objective of maintaining a non-militarised zone in the region was of critical importance in the late 1950s when the Treaty was negotiated and signed, the science of the International Geophysical Year (IGY 1957-58) became the primary means of implementing the peaceful purposes objective. So the obligation has come to be interpreted to mean that scientific investigation and associated activities represent examples of peaceful purpose.

Outside the National Antarctic Science Programmes and their associated activities, it is difficult to provide an exhaustive list of other actions which meet the obligation as to peaceful purpose. In 1959, the limited range of feasible human activities that could take place in the Antarctic was ‘an important ingredient’<sup>247</sup> for the governments agreeing on the Antarctic Treaty. Clearly the goal was to maintain a non-militarised zone. However the dividing line between peaceful and military purposes was not an easy one to draw, as certain peaceful, even scientific, activities possessed possible military purpose.<sup>248</sup>

Bush<sup>249</sup> described any activity that was a peaceful activity as legitimate and therefore allowed in the Antarctic. He made two further qualifications: first, that the activity met the environmental criteria laid down now within the Protocol and second, that the activity have some value to science and/or support scientific cooperation in the region, this being the other fundamental obligation of the Antarctic Treaty. Arguably, following Bush’s criteria, commercial activities, that is those that are carried out primarily to make a profit, may be carried out in the Antarctic as long as they are ‘peaceful’, do not harm the environment and have some value to science. Currently, within the Antarctic Treaty region there are two commercial industries that are carried out within the Antarctic Treaty System, but external to any National Antarctic Programme. These are tourism and marine fisheries. Both are briefly discussed below

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<sup>247</sup> William Bush, ‘The Next 40 Years: The Challenge of Economic Globalisation and 21<sup>st</sup> Century Security Threats’ in Julia Jabour-Green and Marcus Haward (eds), *The Antarctic: Past, Present and Future* (2002) 126, 126.

<sup>248</sup> See Beck, above n 243, 70-74.

<sup>249</sup> Bush, above n 9.

to act as a comparison with mineral exploitation, an activity that is banned, and with bioprospecting.

### *1 Tourism*

Until 1966, virtually all expeditions to Antarctica were organised by governments or had some measure of governmental backing. In that year, there appeared, for the first time, a commercially organized, ship-based tourism expedition. Since then commercial tourism has steadily increased and regular airborne tourism began in 1977. Airborne tourism diminished considerably after the tragic crash on Mount Erebus of the Air New Zealand plane on 28 November 1979 when 257 lives were lost. But the last summer season (2003/04) saw the largest number<sup>250</sup> of tourism visitors to the Antarctic region. Antarctic tourism principally involves short, ship-based visits especially in the Antarctic Peninsula region. Passengers travelling ashore are well supervised and little time is actually spent on continental Antarctica.

The Antarctic Treaty Consultative State parties formally recognised this increase in non-governmental activities in 1994, when they approved Recommendation XVIII: Tourism and Non-Governmental Activities. The recommendation while not directly supporting activities outside those of National Antarctic Programmes does:

1. *Acknowledge* the increase in the development of tourist activities in the Antarctic;
2. *Note* that such visitors are subject to legally binding obligations including, upon its entry into force, the Protocol on Environmental Protection to the Antarctic Treaty; and
3. *Desire* to ensure that those who visit the Antarctic do so in accordance with existing obligations and in accordance with the Protocol pending its entry into force.

An attachment on ‘Guidance for Visitors to the Antarctic’ was produced as was ‘Guidance for those Organising and Conducting Tourism and Non-Governmental Activities in the Antarctic’. This implies an acceptance that non-governmental,

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<sup>250</sup> For the 2003/04 season IAATO reported 19,500 visited the region on IAATO member vessels-a 45% increase over 2002-03. See IAATO statistics for visitor numbers trends from 1992-2004 at [www.iaato.org](http://www.iaato.org).



commercial activities, while not directly supporting the objectives of the Antarctic Treaty do not contravene those objectives and therefore should not necessarily be prohibited.

Tourism meets the Bush criteria, in that, it is a peaceful activity, which some argue directly supports and contributes to science, and if carried out properly does not cause environmental harm. The contribution to science stems from the logistical support tourism vessels provide to national science programmes and individual researchers from those programmes and also, the industry reports from the information they collect on biodiversity, such as reporting whale sightings. The tourism industry reports that Antarctic tourists become important ambassadors for the conservation and protection of the Antarctic region, a factor which indirectly supports science in that it prevents the region from being used for things other than scientific research. The International Association of Antarctica Tourism Operators (IAATO) guidelines supply its Antarctic industry members with strict guidelines to safeguard the well being of passengers and IAATO and the Protocol provide for guidelines to protect the Antarctic environment. While most of the tourist vessels are operated by IAATO members, some are not; this may mean some operators act outside of the guidelines that IAATO has set.

## 2 *Marine Fisheries*

A second example is that of marine fisheries in the Southern Ocean. This commercial activity differs from tourism in at least one respect, in that it is a highly extractive activity. It is a very lucrative and large industry.<sup>251</sup> Southern Ocean fisheries are managed by the CCAMLR Commission, the body established by CCAMLR itself.

While problems with Illegal, Unregulated and Unreported (IUU) fishing in the CCAMLR region have seen an increase in national navies involved in surveillance and policing in the region and while the continued allowance of the activity may have the potential to escalate into a ‘scene or object of international discord’,<sup>252</sup> fishing remains a non-governmental, commercial and legitimate activity within the Antarctic

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<sup>251</sup> See [www.ccamlr.org](http://www.ccamlr.org) for Southern Ocean fisheries catch statistics.

<sup>252</sup> *Antarctic Treaty*, preamble.

Treaty region, as long as it is carried out within the regulations of CCAMLR and the relevant national fisheries authorities.

Considering the Bush criteria in regard to these marine fisheries, the activity arguably has some value to science in that catch statistics may contribute to our understanding of marine species. It is however a highly extractive industry which, thus, has a high impact on the marine environment.<sup>253</sup> The impact and conflict of IUU fishing has created disharmony in the region leading to the recent increased involvement of Southern Ocean surveillance by naval personnel.<sup>254</sup> While this surveillance increases the number of armed forces personnel in the region, their focus is not the strategic use of the Antarctic region, their presence is focused on enforcement of CCAMLR regulations in the CCAMLR fishing zones or surveillance of recognised Exclusive Economic Zones (EEZs) around the Sub-Antarctic Islands. So that while the initial purpose of the activity may be peaceful and while the carrying out of fishing activities in the CCAMLR region by abiding CCAMLR members is also peaceful, the presence of IUU fisheries in the region, some of which fly flags from CCAMLR member states<sup>255</sup> has the potential to lead to international discord in the region. This may lead to increased armed forces presence and then threaten the peaceful use of the region, ultimately breaching the strict interpretation of 'peaceful purposes'. For the foreseeable future, however, this appears to be an unlikely result of marine fisheries in the region.

### 3 *Mineral Exploitation*

The focus on a non-renewal fossil fuel supply in the late 1970s and early 1980s, turned the attention of the world to Antarctic mineral resources which led Antarctic Treaty parties to consider mineral exploitation in the Antarctic region. No exploitation of Antarctic minerals was taking place at that time and a voluntary moratorium on any such activity was put in place to which all Antarctic Treaty parties adhered. This set the scene for the negotiation of an Antarctic mineral resource convention.

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<sup>253</sup> Including high seabird mortality rates.

<sup>254</sup> See for example the case of the Australian navy and their pursuit of IUU fishers all the way to the South African EEZ.

<sup>255</sup> See for example CCAMLR meeting 2003 on Russian involvement in IUU fishing in the Southern Ocean.

After many years, the Convention for the Regulation of Antarctic Mineral Resources from Antarctica<sup>256</sup> (CRAMRA) was negotiated. Some Antarctic Treaty State governments believed that CRAMRA, although providing a high level of environmental protection, would be seen as ‘an incentive to mine’,<sup>257</sup> which led to concerns regarding the peaceful nature of the outcomes of allowing the activity. So once again, while the purpose of the activity was peaceful, its nature had the potential to lead to international discord in the region. For example, the Australian Government said, ‘it was concerned that the Minerals Convention could become an incentive to mining and prospecting, which could in turn generate expectations and pressures which would threaten the basic co-operation amongst Treaty parties.’<sup>258</sup>

Consideration of mineral exploitation before, during and after the negotiation of CRAMRA has caused significant debate. First, some argue that CRAMRA laid down strict environmental safeguards so that the activity, while highly extractive, would not have caused significant environmental damage. Arguably, the activity would have certainly resulted in more than a minor or transitory impact on the environment. Risk to the environment is the often cited reason why France and Australia<sup>259</sup> refused to sign CRAMRA which would have allowed mining in Antarctica. Their refusal to sign meant that CRAMRA could never come into being as the convention required acceptance by all Antarctic territorial claimant states.

Recalling the Bush criteria that the activity must contribute significantly to scientific investigation, is also not met in this instance. While mineral extraction may well be the result of good science, it is not science itself. While some argue that mineral extraction provides the science community with information that they would otherwise not have uncovered, it is suggested that only the exploration and discovery phase of the process can be said to contribute significantly to our understanding of a region, and not the extensive exploitation of the mineral resource itself which

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<sup>256</sup> *Convention on the Regulation of Antarctic Mineral Resource Activities*, opened for signature on 25 November 1988, 27 ILM (1988) (not in force) (‘CRAMRA’).

<sup>257</sup> See Richard Woolcott, ‘Changes and Challenges’ in Robert Herr, Richard Hall and Marcus Haward (eds) *Antarctica’s Future: Continuity or change?* (1990) 21, 26.

<sup>258</sup> *Ibid.*

<sup>259</sup> See the France-Australia Working Paper on Possible Components for a Comprehensive Convention for the Preservation and Protection of Antarctica, XV ATCM (2002).

CRAMRA would have allowed for. Finally, the Bush criteria required that the activity must be peaceful in order for it to be legitimately carried out there. Like marine fisheries, while the initial intention of the activity is a peaceful purpose, it is probable that such an activity, recalling the words of Australia, could threaten the basic cooperation of the Treaty parties. This has the potential to lead to discord in the region, and certainly to discord in the governing of the region, thus ultimately breaching the peaceful purposes objective. Any significant Antarctic mineral find, at a time such as the present when the world's fossil fuels are being depleted, has the potential to lead governments to war to control those resources. Thus while mining is now prohibited within the Antarctic Treaty area by the Protocol it is proposed that the activity would have meet none of the Bush criteria, except that it is *prima facies* for a peaceful purpose.

#### 4 *Bioprospecting*

Bioprospecting also appears, *prima facie*, to be an activity with a peaceful purpose, which not only has high scientific value-adding to our understanding of the biodiversity of the region, but also potentially which generates other benefits that could be applied for the good of all mankind and be of commercial value. If carried out under the strict environmental regulations of the Protocol, it has been proposed that bioprospecting will do little if any significant harm to the Antarctic environment. Assuming technology allows for the synthesis of any bioactive compound, molecule or material that is initially extracted from the Antarctic, there is little risk of species depletion or extinction, probably less so than there is with fisheries<sup>260</sup> and its related activities.

One potential problem with bioprospecting in Antarctica then, appears to be analogous to the IUU marine fisheries and to mineral exploitation. That is, that any commercial activity related to resource extraction, especially in an area where sovereignty is undetermined, while initially carried out for a peaceful purpose and otherwise legitimate as regards the Bush criteria, has the *potentiality* to create internal and external conflict in the region.<sup>261</sup> This conflict opens up the possibility that the

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<sup>260</sup> Burke, above n 107, refers to the commercial stock depletion of Patagonian toothfish already.

<sup>261</sup> See Wolfrum, above n 130.

Antarctic region could see an increased armed forces presence with the objective of protecting the strategic and economic value of the region. This would breach the peaceful purposes objective as laid down in the Antarctic Treaty.

Unlike the IUU problem however, and arguably unlike any mineral extraction that might have taken place in the Antarctic under CRAMRA, any biomaterials that are extracted from the Antarctic will always carry the 'Antarctic stamp'. That is, it will be difficult to argue that your isolated bioproduct was derived from outside of the Antarctic region<sup>262</sup> and therefore not subject to regulation from the Antarctic Treaty System, if the very compound, gene or molecule derived exists and is valuable because of its extreme adaptation to an Antarctic environment. Mineral resources and even many fish species extracted from the Antarctic region do not carry this unique signature. This may then limit the extent of any 'IUU bioprospecting' or biopiracy<sup>263</sup> that could ever take place in the Antarctic, and thereby reduces any potentiality for conflict. As with IUU fishing, however, the lack of legal sanctions within CCAMLR in particular and generally throughout the Antarctic Treaty System, usually means that illegal activities may be worth their inherent risk. Any bioprospecting regulation should therefore include sanction provisions which, while difficult to enforce, might provide the necessary deterrent to any illegal action.

Generally there appears to be at least the perception with respect to any commercial activity in the Antarctic that, if the stakes get too high, the activity could generate expectations and pressures leading to actions which threaten the peaceful purposes objective of the Antarctic Treaty. When mining was perceived to have this capacity to disrupt, the solution was the same that applied to the strict military and nuclear activities in the region, that is, these activities are banned. While appearing to be legally legitimate within the letter of the Antarctic Treaty, that is, for being peaceful in its purpose, bioprospecting in the Antarctic could arguably be banned simply because, as a potentially lucrative commercial activity, it may lead to international

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<sup>262</sup> This is often the argument cited by IUU fishing operators, that is, that the fish was caught outside of the CCAMLR region.

<sup>263</sup> See Graham Dutfield, *Intellectual property, biogenetic resources and traditional knowledge* (2004), 52-59; Biopiracy is defined as the exploitation and appropriation by unauthorized parties, of biological and genetic resources and/or associated traditional medicinal knowledge, without the approval or consent of their holders, and without adequate compensation.

discord and might thus lead to a breach of the peaceful purposes objective of the Treaty.

While the obligation to peaceful purpose, only falls on Antarctic Treaty Party states, any third party state adjudged likely to threaten the peace of the area will be subject to the combined pressures of the parties ‘either to constrain its activities or become a party to the Antarctic Treaty.’<sup>264</sup>

### *C Articles II & III Antarctic Treaty: Freedom of Scientific Investigation Obligation*

#### *1 The Role of Science*

Immediately prior to the signing of the Antarctic Treaty, scientific activities were demonstrated during the International Geophysical Year (IGY) to defuse sovereignty issues. Auburn said, ‘The reason that Antarctica is uniquely dedicated to science does not arise from its particular suitability for research but rather from political necessity.’<sup>265</sup> The success of the IGY was a platform that became a new opportunity for states with involvement in the Antarctic region. Today, for an Antarctic Treaty State party, obtaining Consultative State status depends on the degree to which that state is involved in Antarctic science. Only states conducting ‘substantial scientific research’<sup>266</sup> in the Antarctic are entitled to apply for Consultative Party status. Thus science gives these states an opportunity to vote, and in a consensus voting system therefore a ‘veto’ right, on key issues affecting Antarctica and the Southern Ocean.

Today, science is still often stated as the ‘currency’<sup>267</sup> of the Antarctic Treaty System. In the Antarctic context, science is said to have different goals from those of science conducted domestically,<sup>268</sup> it is **the** legitimising activity in the Antarctic region. For states maintaining and leading science programs in the Antarctic, operating a National

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<sup>264</sup> Beck, above n 243, 88.

<sup>265</sup> Auburn above n 74, 99.

<sup>266</sup> *Antarctic Treaty*, art IX (2).

<sup>267</sup> Patrick Quilty, ‘Antarctica as a Continent for Science’ in Robert Herr, Richard Hall and Marcus Haward (eds) *Antarctica’s Future: Continuity or change?* (1990) 29, 29-30.; See also Bush, above n 247, 131.

<sup>268</sup> Quilty, above n 267.

Antarctic science programme is the key to international credibility. Science programs allow small nations an opportunity to operate as equals alongside more powerful states in the international arena. Therefore, Antarctic science allows nations to influence decisions in a large and important area of the world. This credibility also extends from the nation within the Antarctic Treaty System, to credibility of the Antarctic Treaty System itself within the broader international community as a whole.

## 2 *The Commercialisation of Science: Credibility diminished?*

Although science is the recognised currency in the Antarctic, its role<sup>269</sup> and substance has changed dramatically since the signing of the Antarctic Treaty, and it will continue to change.<sup>270</sup> This change is evidenced by two trends. The first trend is the increased recognition of the policy relevance of science and use of science towards international policy development. In the past, the driver for undertaking scientific research was national interests that provided strategic operations in the southern hemisphere and gave the nation credibility within the Antarctic Treaty System as well as internationally. Also, to some extent, the operation of long-term scientific stations in Antarctica, have been used in support of territorial claims.<sup>271</sup>

Importantly for the purposes of bioprospecting discussions, is the second trend, the trend away from basic or ‘blue-skies’ science towards more applied or directed science. So that rather than basing scientific research on curiosity, science is increasingly directed at very specific questions which may address issues of global importance, or issues relating to the future protection, management, and utilization of the Antarctic and its natural resources. This should not come as a surprise, as it was predicted early on that scientific research would be directed at answering specific questions. But along side of this, it was also predicted that this directed science would be ‘commissioned’, where commissioned represents increased investment by commercial organisations, seeking to derive a commercial or industrial advantage from that research.<sup>272</sup>

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<sup>269</sup> Ibid 31.

<sup>270</sup> See Press, above n 174,162.

<sup>271</sup> This is true-even recognising the provisions of *Antarctic Treaty*, art IV (2).

<sup>272</sup> See Press, above n 174, 162-163.

Quilty argued as early as 1990, that if too high a proportion of Antarctic science was directed, there might be criticism in the long term that the Antarctic Treaty System is a convenient and 'cosy club for those with other than pure goals for the region.'<sup>273</sup> Directed science has increased even since his statement in 1990, with many National Antarctic Programmes shifting focus from basic science towards directed research. There has also been the accompanying increase in commissioned research that Press predicted. The general questions this raises are: does this change in science towards a more directed, commissioned approach breach the scientific investigation and cooperation objective of the Antarctic Treaty? Should directed scientific research projects, especially those that are commissioned, be banned from the Antarctic region? Does that go as far as meaning that all commercial activities should be banned from the region as breaches of Articles II and III of the Antarctic Treaty? If conducting commercial or commissioned science is not a direct breach of the Antarctic Treaty it still may reduce the credibility of the Antarctic Treaty System and that of the states operating within that system.

The answer to these questions has specific relevance to the question of allowing bioprospecting in the region. Bioprospecting is an example of the continuing shift towards commercially-driven, applied, directed science in the Antarctic. It is argued that this shift will also create criticism that the Antarctic Treaty System is once again, as with mineral exploitation, turning its attention away from the pure goals for the region, as evidenced by the IGY, for the benefit of the 'cosy club'. This assumes of course that the goals for the region are, or at least were at one point as pure as the snow.

With this in mind the questions regarding the legal implication of bioprospecting in the Antarctic are: Is bioprospecting simply an activity that should be considered scientific investigation and which, therefore, supports the obligation to promote freedom of scientific investigation and co-operation toward that end or is it more than that? If it is a commercial activity that does not contribute to the obligation for scientific investigation in the region then is it an activity that should be banned from the Antarctic region? Bioprospecting has been referred to as simply another 'flavour

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<sup>273</sup> Quilty, above n 267, 37.



of science.<sup>274</sup> While this appears to be unhelpful in the quest to uncover an adequate definition of the activity, it does imply the bioprospecting should be allowed to proceed in the Antarctic just as other science is allowed to proceed. That is, under the strict environmental regulations of the Protocol and within the context of the additional obligations of the Antarctic Treaty. For the purposes of these discussions, the obligations prescribed in Articles II and III are discussed below.

### 3 *International Cooperation in Scientific Investigation*

The notion of international cooperation in scientific investigation supported generally by the Antarctic Treaty and specifically in its preamble and in Articles II and III, is considered here. Bush, among others, has argued that there is the potential if the trend towards ‘economics research’ continues to transform the traditional non-controversial scientific cooperation under the Antarctic Treaty to one of competition, it could lead to controversy and have serious consequences for cooperation between states under the Antarctic Treaty regime.<sup>275</sup>

While it may be true that an increase in commercially-funded scientific research in the Antarctic could lead to less collaboration between research teams, scientific research in Antarctica is extremely difficult; it almost always requires cooperative effort between states at both a practical and political level. Even the US requires cooperation from New Zealand for its operations at McMurdo Station and Amundsen-Scott South Pole Station, and to a lesser extent to Chile and Australia for its operations in the Antarctic Peninsula and Southern Ocean regions. Without the cooperative arrangements that have been in place among those nations since the 1950s, it would be difficult and expensive for the US to carry out the broad science programme that it currently maintains in the Antarctic.

Some academics have questioned whether bioprospecting generates ‘scientific observations and results’.<sup>276</sup> Since only scientific obligations and results are required to be made freely available and exchanged under the Antarctic Treaty Article III

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<sup>274</sup> See Supply Workgroup Report from the Bioprospecting in Antarctica Workshop, Christchurch, (2003).

<sup>275</sup> See Bush, above n 247, 137-139.

<sup>276</sup> See, eg, Jabour-Green and Nicol, above n 23,100.

obligation, clarification on the issue is important. Some argue that bioprospecting does not. The argument presented is that any bioprospecting is simply data collection for the purposes of resource related activities and which arguably would not impose exchange and free availability obligations because it is not scientific observations and results. It is difficult to see what would not be considered to fall within this broad category. It has also been suggested, however, that the sample collection (done in Antarctica) and the isolation, characterisation and culture phases (done in a national laboratory) are scientific investigation, while downstream processes including screening for bioactivities and any subsequent product development fall outside of scientific investigation and fall within a category referred to as 'exploitation-driven science'.<sup>277</sup> For some it is simply 'resource exploration'.<sup>278</sup> While there has been little debate on this point it would appear that downstream product development may in fact fall outside of the scientific investigation definition, however it seems conceivable that it could well be interpreted as 'result'. Informed discussion is needed before any conclusions can be drawn.

While neither 'scientific investigation' nor is the phrase 'scientific observations and results' are defined in the Antarctic Treaty, the matter was raised during the Antarctic Treaty negotiations. It was not seriously debated even despite UK concerns that national programme activities might be carried out under the 'cover of research'.<sup>279</sup> The concern during the negotiations was that activities labelled 'scientific investigation' would actually be military or non-peaceful activities hiding behind the veil of science, or were in reality, sovereignty-related. Consideration of the definition of 'scientific investigation' today must be done in the context of the current political arena. That is, Antarctic research programmes are assuming a more applied character and it is being questioned whether this applied character should be considered scientific investigation or merely the first stage in resource exploitation. The distinguishing line is difficult to draw. For example in the 1980s, the British Antarctic Survey (BAS) science programme focused on 'resource-oriented research'<sup>280</sup> in the physical science context. The borderline between scientific investigation and resource

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<sup>277</sup> Ibid 102.

<sup>278</sup> Alfred Soons, 'Regulation of Marine Scientific Research by the European Community and Its Member States' (1992) 23 *Ocean Development and International Law* 259, 260.

<sup>279</sup> Beck, above n 240, 107.

<sup>280</sup> See British Antarctic Survey (BAS), Memorandum of the British Antarctic Survey, 6 Dec 1982.

exploration proves vague and confused<sup>281</sup> and it is difficult if not impossible to separate pure research from applied research, and often the former leads to the later. Also in many cases it is impossible to predict the commercial implications of any scientific research.

The current move in the Antarctic region towards research into understanding the biological environment and the regions' biodiversity<sup>282</sup> may cloud the distinction between these pure science programmes and any bioprospecting that is directly related to this research or is a result of this research. Therefore while it has been proposed that bioprospecting activities are simply another 'flavour of science' which does represent scientific investigation and therefore generates scientific observations and results, the difficulty with allowing bioprospecting in the Antarctic may stem from the fact that in general it is ultimately a commercially-driven activity. The distinction from this activity and other scientific investigation may therefore be found in its commercial direction as revealed by the source of the funding which supports it. This factor may require consideration in any application for logistics support to Antarctica.

#### *4 Articles II and III Antarctic Treaty: The Extent of the Obligation*

The few discussions to date surrounding the legal implications of bioprospecting in the Antarctic have focused on the Article II and III obligations of the Antarctic Treaty. Exactly what the extent of these obligations mean for Antarctic Treaty State parties and, whether bioprospecting is an activity that can legally be carried out in the Antarctic, while allowing state parties to continue to meet these obligations, is problematic.

The second fundamental obligation of the Treaty, that of freedom of scientific investigation, is first mentioned in the preamble. The Treaty then states the obligation in a general way in its Article II, saying that 'Freedom of scientific investigation in Antarctica and co-operation toward that end, as applied in the International Geophysical Year, shall continue...' In support of this, Article III goes on to give

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<sup>281</sup> Beck, above n 243, 108.

<sup>282</sup> For example, New Zealand's BIOROSS marine biodiversity programme and the Latitudinal Gradients Project (LGP).

specific indications of what was foreseen by the Treaty Parties in Article II. Article III states:

1. In order to promote international cooperation in scientific investigation in Antarctica, as provided for in Article II of the present Treaty, the Contracting Parties agree that, to the greatest extent feasible and practicable:
  - a. information regarding plans for scientific programs in Antarctica shall be exchanged to permit maximum economy of and efficiency of operations;
  - b. scientific personnel shall be exchanged in Antarctica between expeditions and stations;
  - c. scientific observations and results from Antarctica shall be exchanged and made freely available.

Bush argues that Articles II and III only served to ‘crystallize[d] pre-existing state practice’. He also noted that the phrase ‘freedom of scientific investigation’ implied a ‘freedom of movement in and around Antarctica by surface and air, at least for the purposes of scientific investigation.’<sup>283</sup> While this seems trivial, it is the first glimpse at the compromise on sovereignty that the Treaty parties would have to agree to. Generally, it gave Antarctic Treaty state parties the right to freely move about the Antarctic continent, regardless of any states’ position as to territorial claims, when movement usually within a territory is under the control of the sovereign.

The provisions were codified by a Recommendation<sup>284</sup> which states the standard format for exchange of information. This standard format includes providing details to other Antarctic Treaty Consultative State parties such as advance notification of research plans and logistics and supply arrangements. Today, the exchange and free availability obligation has come to be more widely interpreted. Many states cite the phrase to imply that all activities related to scientific investigation on the continent should be shared and be made available for free or without reservation to anyone who requests the information. The Legal Workgroup from the Bioprospecting in Antarctica Workshop believed the obligation was for the information to be placed into the ‘public domain’ and they agreed that this was not necessarily synonymous with ease of access to data.<sup>285</sup>

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<sup>283</sup> Bush, above n 243, 53.

<sup>284</sup> ATCM Recommendation VIII-6, ATCM VIII (1975).

<sup>285</sup> Supply Workgroup, above n 274.

Whatever the current extent of the obligation, it appears that the ‘freedom of scientific investigation’ obligation has historically been met by all Antarctic Treaty State parties. Through the cooperative arrangement of the Antarctic Treaty Consultative Meeting system and related organisations such as the Council of Managers of National Antarctic Programmes (COMNAP), all National Antarctic Science Program information is prepared and presented to all Treaty parties at the annual meetings. Many of the programmes operate cooperative arrangements when providing air, marine and surface support, so that generally there is no restriction on freedom of scientific investigation in a practical sense. It is the more specific obligation laid down in Article III that may prove to be the most difficult to interpret and apply in the context of bioprospecting activities in the Antarctic. Further consideration of this point is presented below.

#### *5 Article III Antarctic Treaty: Further Consideration*

Bush notes that the Antarctic Treaty parties realised as early as 1973 that it was Article III, with its obligation to make freely available scientific results and observations from Antarctica, which would have implications for the exploration of economic resources of the region.<sup>286</sup> This is because activities related to the exploration of economic resources<sup>287</sup> has the potential to place limits on free availability of observations and results. The question is, if this potentiality is realised, are these limits appropriate within the Article III obligations of the Antarctic Treaty?

While there have been few problems to date with either sections a or b of Article III, paragraph 1, in discussions involving bioprospecting in the Antarctic, problems do appear to arise as regards the extent of the obligation in section c. Article III (1) (c) is repeated here in its entirety, and reads:

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<sup>286</sup> See Bush, above n 243, 55; See Antarctic Treaty Document AT30051973 ‘Report of a Meeting of Experts organised by the Fridtjof Nansen Foundation on existing law relevant to the authorisation or prohibition of mineral exploration for commercial purposes in the Antarctic Treaty area’, section 23.

<sup>287</sup> Jabour-Green and Nicol prefer to utilise the phrase ‘commercialisation of science’ instead of ‘exploration of economic resources’ when asking this question.

1. In order to promote international cooperation in scientific investigation in Antarctica, as provided for in Article II of the present Treaty, the Contracting Parties agree that, to the greatest extent feasible and practicable:

c. scientific observations and results from Antarctica shall be exchanged and made freely available.

An Antarctic Treaty document of 1972 describes Article III (1) (c) as making ‘possible the exchange of scientific information freely and directly between scientific organisations.’<sup>288</sup> The precise nature, however, of the disclosure and exchange requirements imposed by Art III (1) (c) is uncertain.<sup>289</sup> To date, little debate on the issue has been required as scientific investigation has primarily been a result of state government funded and supported expeditions which carries with it obligations to disclose and publish results. Scientists also clearly recognise the value of publishing their data, observations and results in peer reviewed journals. Publication has at least a three-fold benefit for these scientists: one, it often meets their obligations prescribed by National Antarctic Programmes for logistical support for their field research component; two, it often attracts new or continuing funding for their research; and three, it also advances their international reputation as scientists.

With the emergence of privately-funded commercial research activities, there is not always an obligation to publish prescribed by the funding organisation. This may lead to unpublished Antarctic observations and results and may also involve protection of associated Intellectual Property. It may also include ‘trade secrets’ limiting the free availability of any results, all of which may be in breach of the Article III (1) (c) obligation. In the case of bioprospecting there may already be exclusive collaborative arrangements between Antarctic researchers and commercial companies which have funded the research and which call for confidentiality and exclusive rights to any discoveries.

This is, however, not the first instance of the Antarctic Treaty System dealing with availability of observations and results from Antarctica in regard to resources. The issue has been discussed in the context of an Antarctic mineral regime. When CRAMRA was finalised it included Article 16 dealing with the availability and

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<sup>288</sup> See Bush, above n 9; See Antarctic Treaty Document AT30101972.01 ‘Report and recommendations of the VIIth Antarctic Treaty Consultative Meeting, para 11.

<sup>289</sup> Jabour-Green and Nicol, above n 23, 104.

confidentiality of data and information. The article is a reiteration in part of the Article III (1) (c) obligation with a two-part proviso and one potentially significant difference. It reads:

Data and information obtained from Antarctic mineral resource activities shall, to the greatest extent practicable and feasible, be made freely available, provided that:

- (a) as regards data and information of commercial value deriving from prospecting, they may be retained by the Operator in accordance with Article 37<sup>290</sup>;
- (b) as regards data and information deriving from exploration or development, the Commission shall adopt measures relating, as appropriate, to their release and to ensure the confidentiality of data and information of commercial value.

The inclusion of this article within CRAMRA implies that the parties were flexible as to the extent of the obligation to make data and information freely available, even going so far as to ‘ensure the confidentiality of data and information of commercial value.’ The article does not make ‘results’ part of the exchange agreement. Whether this was a deliberate omission or simply an oversight is unclear. It was one of the CRAMRA Commission’s functions to facilitate and promote the exchange of information and specifically ‘to adopt measures relating to the availability and confidentiality of data and information, including measures pursuant to Article 16’.<sup>291</sup>

Inclusion of these provisions in CRAMRA was a signal that the Antarctic Treaty Consultative parties would not limit nor prohibit an activity from taking place in the Antarctic region if it generated data of a confidential or commercial character. This implies that *any* activity that generates confidential or data of commercial value will not *prima facie* mean that the confidential nature of the data will be in breach of the Article III (1) (c) ‘freely available’ obligation and therefore the activity may proceed.

## 6 *Intellectual Property Rights, Patents and the Article III Obligation*

Intellectual Property (IP) is a generic term that refers to a range of private property rights<sup>292</sup> accorded to ‘creations of the mind’.<sup>293</sup> Since the US Supreme Court case of

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<sup>290</sup> CRAMRA, art 37 deals with obligations surrounding ‘prospecting’.

<sup>291</sup> CRAMRA, art 21 (1) (h).

<sup>292</sup> TRIPS Agreement, preamble, para 4.

*Diamond v Chakrabarty*<sup>294</sup> these creations of the mind may include IP rights associated with micro-organisms, and micro-organisms are emerging as a large and important source of Antarctic biodiversity.

IP rights vary globally and there are many different types of such rights in use today. Generally, however, there are three major categories of IP: patents, trademarks and copyright. Of these three, patents are of most import to any study concerning bioprospecting and genetic resources.<sup>295</sup> Patents are the primary means of granting exclusive use of a novel product or process to the inventor for a limited period of time. Patents are granted on a national basis and therefore domestic laws dictate the treatment, protection and enforcement of patenting rights. They are however also subject in some cases to international agreements and constraints. In New Zealand for example, patenting rights are provided for under the Patents Act 1953.<sup>296</sup> A patent is an intellectual property right granted by a state authority which excludes others from the use or benefit of a patented invention for a limited time. In New Zealand, a patent's life is 20 years.

At present there appears to be nothing specific in the domestic law of states which prevents an individual or organisation from protecting the IP associated with an Antarctic-derived novel product or bioproduct, as long as that product fulfils the essential patent criteria under the domestic legislation. The criteria do not allow for patenting the discovery itself, that is, the inventor must add a useful step which results in a novel product or process. There is no evidence that patenting offices give consideration to the fact that the product or process may have been derived from the Antarctic region. In fact, many patents already exist (Table 2, next page) in relation to Antarctic-derived products and processes.<sup>297</sup> All of the Antarctic-related patents applied for to date have been from members of an Antarctic Treaty Party state.

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<sup>293</sup> Kim Connelly-Stone, 'Patents, Property Rights and Benefit-sharing Issues' in Alan Hemmings and Michelle Rogan-Finnemore (eds) *Antarctic Bioprospecting* (2005) (In press).

<sup>294</sup> *Diamond v Chakrabarty* (1980) 447 U.S. 303.

<sup>295</sup> Nicholas Mason, *Forging a New Global Commons: Introducing common property into the global genetic resource debate* (MA Thesis, University of Canterbury, 2004) 18.

<sup>296</sup> *The Patents Act 1953* (NZ).

<sup>297</sup> Sample, above n 6; At least 92 patents referring to Antarctic organisms or molecules extracted from them have been filed in the United States and a further 62 patents have been filed in Europe.



PATENT	YEAR	SECTOR
JP2003144190	2003	Industry applications/agriculture
WO02102406	2002	Pharmaceutical/cosmetics
WO0238121	2002	Pharmaceutical/cosmetics
JP2002262859	2002	Pharmaceutical
JP2002101847	2002	Food
US6387692	2002	Pharmaceutical/agriculture
NZ337239	2001	Pharmaceutical
WO0153511	2001	Food
NZ336376	2000	
ES2146162	2000	
NZ33445	2000	
US6074863	2000	Industry applications
JP2000044658	2000	Health
US6020180	2000	
US5962624	1999	Cosmetics
US5928933	1999	Pharmaceutical/agriculture
US5908769	1999	
EP0908522	1999	
WO9842731	1998	Pharmaceuticals/agriculture
US5773266	1998	
US5753473	1998	Food
JP10084988	1998	Food
JP10036301	1998	
GB19970014412	1997	Food
JP9176036	1997	
US5677168	1997	
US5658769	1997	
CA2244917	1997	
DE19603575	1997	
IT1274482	1997	
ES2101653	1997	
US5604119	1997	Pharmaceuticals
US5561057	1996	
JP8154690	1996	
US5407828	1995	Pharmaceuticals
JP7115992	1995	Pharmaceutical/agriculture
US5342768	1994	Food
US5273898	1993	Food
JP5236886	1993	
WO9218638	1992	Industry applications
US5156963	1992	
WO9015868	1990	
US4720458	1988	
JP9176036	1988	Cosmetics

Table 2: List of patents granted in respect of Antarctic biodiversity since 1988. The determination of some sectors was inconclusive from the patent description and the list is not exhaustive. (Data compiled by the author from information contained in ATCM 2004 IP-106).

Allowing for patenting of products and processes associated with Antarctic bioprospecting raises two issues. The first is of a general nature, that is, that allowing patenting would lead to greater involvement of commercial interests in the Antarctic—this has generally been seen as against the spirit of the Antarctic Treaty. This same argument was delivered during the negotiation of CRAMRA, that is, that setting up a regulatory framework which provided certainty of access and property rights regarding mineral resources would only encourage commercial involvement, and would act as incentive to mining. With the demise of CRAMRA and the moratorium on mining, it is impossible at this stage to know whether this would have proved true. Therefore any attempt to negotiate a bioprospecting convention could be seen as providing an incentive to bioprospect in the region.

Secondly and more specifically, in the context of the Antarctic Treaty and its Article III (1) (c) obligation, the lawfulness of patenting must be considered. The mandate for the free exchange of information has led to fears that commercially focussed research, and in particular, patenting would be in breach of Article III and therefore would be contrary to the Antarctic Treaty.

While Bush argues that commercial activities may not breach the Article I peaceful purposes obligation, he takes an extreme position on the Article III obligation, stating that all research of a commercial nature (whether it leads to IP protection or not) is in danger of breaching the Article III requirements. Bush noted that ‘A growth in the demand for research of economic relevance is likely to run counter to the Antarctic Treaty requirement that “scientific observations and results from Antarctica shall be exchanged and made freely available.”<sup>298</sup> Counter arguments are based on the notion that the patent system is in fact a device allowing scientific information and new discoveries to enter the public domain, while protecting the inventor’s rights for a limited time.

Generally, a patent applicant must meet four requirements in order to be successful. Three of these four refer specifically to the invention itself (novelty, non-obviousness, & usefulness). The fourth requirement is that the product or process be described

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<sup>298</sup> Bush, above n 247, 138.

with adequate specification and disclosure. In the United States for example, the US Constitution clearly states that the patent system was established in order to ‘promote the Progress of Science and the useful Arts by securing for limited times to Authors and Inventors the exclusive right to their respective Writings and Discoveries.’<sup>299</sup> So that, the United States patent law finds its rationale for allowing patenting in its instrumental power to promote scientific progress, not in a basic right to one’s own intellectual property. The patent encourages disclosure of information that otherwise might not be open to scrutiny by others while protecting the exclusive right of use of the inventor.

In New Zealand that sentiment was supported in the *Pharmaceutical Management Agency Ltd*<sup>300</sup> case, when Gault J. recently put it thus: ‘The patent system rests on the policy that a limited term monopoly will be granted as an incentive to innovation but subject to the invention and the best method of carrying it out being disclosed and made available...’<sup>301</sup>

The patent holder may only control the exploitation of the information, the information itself cannot be locked up.<sup>302</sup> Whether this really satisfies the Article III (1) (c) obligation is at the heart of any debate. While patents promote knowledge sharing by requiring the details of the patented invention to be placed in the public domain,<sup>303</sup> and while this disclosure and sharing of information clearly supports the spirit of Article III, it is not clear whether patenting breaches the legal letter of the Article III (1)(c) obligation. While the legal letter of the law is usually of fundamental importance the spirit of cooperation that has existed amongst Antarctic Treaty parties has arguably supported the robustness and effectiveness of the Antarctic Treaty System to date and may be of at least some importance.

Consideration of Antarctic Treaty states that are developing nations must be taken with care. There is a widespread belief amongst developing nations that the IP right systems are mainly designed by the developed nations for the specific purpose of

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<sup>299</sup> *United States Constitution*, art 1 s 8.

<sup>300</sup> *Pharmaceutical Management Agency Ltd. V Commissioner of Patents* (2000) 2 NZLR 529.

<sup>301</sup> *Ibid* 533.

<sup>302</sup> Andrew Allen, ‘Biotechnology, Research and IP Law’ in Canterbury University School of Law (ed), *The Canterbury Law Review* 8 (2002) 237-424, 368.

<sup>303</sup> Australian Law Reform Commission, *Genes and ingenuity: gene patenting and human health report* (2004) Sydney, 58.

exploiting the natural resources of developing nations<sup>304</sup> and are not necessarily a device established to promote the progress of science. Third World Governments see no evidence that patents encourage research, saying this is a benefit often wrongly cited by industrialised countries.<sup>305</sup> This belief must be examined carefully in a system that has often been referred to as a 'rich man's club'<sup>306</sup> but which now consists of developed and developing nations.

For this reason, any regulation within the Antarctic Treaty System on the use of Antarctic living resources, which includes patenting rights, may see opposition from the developing nations that are Consultative State parties to the Antarctic Treaty.<sup>307</sup> Consensus may thus be difficult to achieve on the formulation of bioprospecting regulation which allows for protection of IP rights.

The clause 'to the greatest extent feasible and practicable' allows Antarctic Treaty parties some discretion,<sup>308</sup> and some even argue that this qualification may reduce the level of obligation or in fact eliminate the obligation during times when it is not feasible or practical to meet it.<sup>309</sup> The onus is left to the goodwill and efficiency of the state.<sup>310</sup> Attention has also been drawn to the use of the word 'shall' in the phrase and not the more obligatory word 'will'. However, in practice the parties have had the expectation that the obligation will be met. It also should be noted that the acquisition of intellectual property rights is only one phase of a typical bioprospecting project. The first stage, the discovery or collection of biological resources or material, does not itself constitute or create intellectual property - a discovery does not equate to an invention.<sup>311</sup> Therefore any consideration of the legality of bioprospecting in the context of the Article III obligation should discuss the legality of the individual phases of that activity.

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<sup>304</sup> Krishna Dronamraju, *Biological and social issues in biotechnology sharing* (1998) 1.

<sup>305</sup> Cary Fowler, 'Biotechnology, patents and the Third World' in Vandana Shiva and Ingunn Moser (eds) *Biopolitics: A feminist and ecological reader on biotechnology* (1995) 214, 219.

<sup>306</sup> Beck, above n 243,184.

<sup>307</sup> Keith Suter, *Antarctica: private property or public heritage?* (1991) 23; Calls inclusion of India in ATS a 'shrewd move'.

<sup>308</sup> Jabour-Green and Nicol, above n 23, 100.

<sup>309</sup> Legal Workgroup, above n 200.

<sup>310</sup> Beck, above n 243,104.

<sup>311</sup> Connelly-Stone, above n 293.

## 7 *The Article III Obligation and other International Requirements*

### (a) *The Agreement on Trade-Related Aspects of Intellectual Property Rights 1994 (TRIPS Agreement)*<sup>312</sup>

The Agreement on Trade-Related Aspects of Intellectual Property Rights 1994 (TRIPS Agreement) is a multilateral treaty with the objectives of reducing impediments and distortions to international trade, promoting effective and adequate protection of intellectual property rights, and ensuring that measures and procedures to enforce those rights do not themselves become barriers to legitimate trade.<sup>313</sup> Specifically its article 7 reads:

The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of production and users of technological knowledge and in a manner conducive to social and economic welfare, and to the balance of rights and obligations.<sup>314</sup>

It also sets out the requirements regarding patentable subject matter in its article 27 saying that:

Patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application...patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produces.<sup>315</sup>

The TRIPS Agreement requires that signatory states must make patents available for any invention or creation that satisfies the patenting criteria and in exchange the conditions on the patent applicant require that the applicant 'shall disclose the invention in a manner sufficiently clear and complete'.<sup>316</sup>

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<sup>312</sup> *Agreement on Trade-Related Aspects of Intellectual Property Rights*, opened for signature 15 April 1994, 1869 UNTS 229, entered into force 1 January 1995) ('*TRIPS Agreement*').

<sup>313</sup> *TRIPS Agreement*, preamble.

<sup>314</sup> *TRIPS Agreement*, art 7.

<sup>315</sup> *TRIPS Agreement*, art 27.

<sup>316</sup> *TRIPS Agreement*, art 29.

Importantly all of the Antarctic Treaty state parties are signatories of the TRIPS Agreement. So that any decision within the Antarctic Treaty System that patents regarding an Antarctic derived product or process could be withheld simply because they are derived from the Antarctic region may contravene the requirements of the TRIPS Agreement.

The TRIPS Agreement does, however, include allowable exclusions from patenting and allowable restrictions on the use of patents. Article 27, paragraphs 2 and 3, allows states to exclude patents when it is ‘necessary to protect ordre public or morality...or to avoid serious prejudice to the environment...’ but they may not exclude micro-organisms.<sup>317</sup> While the opposition to patenting of biological-related inventions on ethical grounds is growing<sup>318</sup> there are some countries that do not include this provision for exclusion in their domestic patent legislation.<sup>319</sup> It may be that with the recent calls for creating a global commons over genetic resources and also the calls for Antarctic to be regarded as a global commons, the exclusion on ethical grounds could be successfully used by the Antarctic Treaty System, or by those outside it, who oppose patenting of Antarctic-related bioproducts and processes for whatever reason, so that patents in respect of Antarctic bioprospecting could legally be denied. Ethical issues surrounding the patenting of discoveries involving micro-organisms and the utilization of genetic resources, remain the subject of policy considerations at both a national and international level. Further discussion is required regarding these ethical issues to determine the implication of the TRIPS Agreement on patents related to Antarctic bioprospecting.

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<sup>317</sup> *TRIPS Agreement*, art 27 paras 2-3.

<sup>318</sup> Jabour-Green and Nicol, above n 23, 89.

<sup>319</sup> For example the United States and Australia.

(b) *Convention on Biological Diversity*<sup>320</sup> & *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*<sup>321</sup>

The discussion of exploitation of natural resources is fundamentally important in the context of access to and benefit-sharing from Antarctic biodiversity. While the Antarctic Treaty refers to issues related to access to the Antarctic region for the purposes of scientific investigation and inspection, it does not contain provisions specifically regarding either of these subjects in the context of living resources. CCAMLR, of course, considers access to marine living resources for the purposes of 'rational use'.

Outside of the Antarctic Treaty System, there is an international convention which takes into consideration regulations for access to and benefiting-sharing from biodiversity. This multilateral convention is the 1992 UN Convention on Biological Diversity (CBD). All of the original 12 signatory states to the Antarctic Treaty have signed the CBD. All seven of the territorial claimant states have ratified the CBD, however while the US has signed, it has not ratified the Convention. The CBD is 'a framework agreement that outlines goals and policies for the conservation of biological diversity...but which leaves countries to operationalize the principles'<sup>322</sup> to reach those goals and implement policy. The CBD commits parties to take steps to achieve three objectives: conserving biological diversity, using natural resources sustainably and fairly and equitably sharing benefits derived from the use of genetic resources.<sup>323</sup> It is the last objective that is the focus of this section of the thesis, as the management of any benefits derived from Antarctic bioprospecting is of particular importance in the context of the Antarctic Treaty System.

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<sup>320</sup> *Convention on Biological Diversity*, opened for signature on 5 June 1992, 31 ILM (1992) (entered into force 29 December 1993) ('CBD').

<sup>321</sup> *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*, COP VI Decision VI/24 ('*Bonn Guidelines*').

<sup>322</sup> Karin Timmermans, 'Intellectual property rights and traditional medicine: policy dilemmas at the interface' (2003) 57 *Social Science and Medicine* 745, 747.

<sup>323</sup> Kevin Grey, 'Accomplishments and New Directions?' (2003) 52.1 *The International and Comparative Law Quarterly ICLQ* 256, 261-263.

The CBD reaffirmed<sup>324</sup> in Article 3 that states have a sovereign right to exploit their own resources pursuant to their own environmental and developmental policies. Article 15 provides that the authority to determine access to genetic resources rests with national governments and is subject to national legislation and where access is granted it should be on ‘mutually agreed terms’. Contracting parties are also required to adopt measures that aim to achieve the fair and equitable sharing of benefits arising from the commercial (and other) utilisation of genetic resources, and the results of research and development, with the state that provided the resource.<sup>325</sup>

With its focus on access and benefit sharing, the CBD's Conferences of the Parties (COPs) discusses Intellectual Property rights frequently in the context of benefit sharing. At the 6<sup>th</sup> COP, work included the development of the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising Out of their Utilisation<sup>326</sup> (Bonn Guidelines). While non-binding, they provide guidance on matters such as the negotiation, monitoring and evaluation, implementation and enforcement of access and benefit-sharing agreements, procedures for obtaining prior informed consent and mechanisms for benefit-sharing.<sup>327</sup>

Ownership of relevant IP rights is listed as only one of a number of possible benefits in Appendix II of the Bonn Guidelines. Other benefits include non-monetary benefits such as: Sharing of research and development results; Collaboration, cooperation and contribution in scientific research and development programmes, particularly biotechnological research activities, where possible in the provider country; Participation in product development; Collaboration, cooperation and contribution in education and training; and admittance to *ex situ* facilities of genetic resources and to databases.

While the Antarctic Treaty System on the whole cannot be a party to the CBD, the withdrawn SCAR Working Paper recognised the value that the CBD provided. The withdrawn Working Paper stated that:

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<sup>324</sup> CBD, art 3 is identical to *Stockholm Declaration* (1972), Principle 21, which was the first international agreement to formally state this principle.

<sup>325</sup> CBD, art 15(7); See also CBD art 16, 19 regarding access to and transfer of technology, and handling of biotechnology and distribution of its benefits.

<sup>326</sup> *Bonn Guidelines*, CBD COP Decision VI/24.

<sup>327</sup> See Connelly-Stone, above n 293.



‘it would now appear that the Antarctic is now the only part of the world, excluding the High Seas, to which the Convention (on Biological Diversity) does not apply. Yet it might reasonably be expected that...such a globally accepted progressive approach...would be entirely appropriate.’<sup>328</sup>

It remains to be seen how appropriate the CBD and Bonn Guidelines will be in the context of the Antarctic Treaty System and the Antarctic region, especially given that the US has not ratified the CBD and the significant, though non-claimant, role the US plays in the Antarctic region. The CBD, based as it is on sovereign ownership does however mention in its article 5 that:

‘Each Contracting Party shall...cooperate with other Contracting Parties...through competent international organizations, in respect of areas beyond national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of biological diversity.’<sup>329</sup>

This article could be relied upon by the contracting state parties to work together within the ATS to regulate any utilization of Antarctic biodiversity.

#### *D Summary*

It appears that *prima facie*, bioprospecting in Antarctica does not breach the Article I obligation for use of Antarctica for peaceful purposes only. Like any commercial activity however, it may have the potentiality to lead to international discord in the region which would breach the peaceful purposes obligation.

The Article II obligation for freedom of scientific investigation and cooperation towards that end is not easy to define. It may mean that all commercial activities in the Antarctic are in danger of breaching the obligation.

In particular, it is the obligation for free availability and exchange of scientific observations and results as required under Article III that may prove to be the most

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<sup>328</sup> SCAR, above n 195, para 5.

<sup>329</sup> CBD, art 5.

problematic. Patents for Antarctic-derived bioprospected materials already exist. It appears that protection of Intellectual Property rights do not necessarily breach the Article III (1) (c) obligation. In fact, requirements under the TRIPS agreement may mean that patents for Antarctic-derived, bioprospected materials cannot be denied. Consideration of ethical issues surrounding patenting and whether patenting does in fact meet the obligation for free availability and exchange must be explored, need to be openly and formally discussed before any conclusions are drawn.

### III THE LEGAL IMPLICATIONS OF BIOPROSPECTING IN THE ANTARCTIC: SOVEREIGNTY

#### *A Introduction*

Sovereignty in Antarctica is contentious. Seven states make territorial claims to various portions of Antarctica. To date, the legitimacy or otherwise of these claims remains unresolved. The unresolved nature of the territorial claims means that there is no universally recognised sovereign (or sovereigns) over any portion of Antarctica.

International law provides that it is a sovereign state's right to exploit its natural resources. The Antarctic Treaty makes no provision for the utilization of Antarctic resources, but importantly, it does involve an obligation on the parties to compromise on sovereignty. This means that any legal discussion involving the utilization of the Antarctic's natural resources is problematic.

Watts put it succinctly when he said 'It is impossible to discuss any legal issue in the Antarctic context without sooner or later, and usually it is sooner, having to refer to the differences over sovereignty.'<sup>330</sup> An essential requirement for the functioning of the Antarctic Treaty System has always been balancing sovereignty considerations.<sup>331</sup> This is reflected initially in Article IV of the Antarctic Treaty and subsequently in the conventions and numerous recommendations that restate and reaffirm the Article IV agreement.

The unresolved nature of Antarctic sovereignty is a source of contention amongst the Antarctic Treaty parties themselves, which while abated because of Article IV of the Antarctic Treaty may reignite in the future. Commercial opportunities involving Antarctic resource use and management may well be the source of such conflict. The unresolved nature of Antarctic sovereignty is also a source of contention between the Antarctic Treaty parties and third party states many of whom believe the resources of the Antarctic region should be utilized for the benefit of all mankind.

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<sup>330</sup> Watts, above n 59, 111.

<sup>331</sup> See Davor Vidas, *Implementing the Environmental Protection Regime for the Antarctic* (2000), 266.

Similar issues were faced during the negotiation of CRAMRA and accommodations were created to address these internal and external conflicts. While lessons can be learned from CRAMRA consideration must also be directed to emerging norms for utilizing resources in areas beyond national jurisdiction and those global resources which many believe should either be utilized for the benefit of all mankind or, on the contrary, not considered a resource to be utilized at all.

In order to consider the legal implications of bioprospecting in the context of unresolved sovereignty, Part III of this thesis will discuss the concept of sovereignty itself, the Antarctic territorial claims, and the legal operations of Article IV of the Antarctic Treaty. Consideration is then given to the internal and external challenges that any discussions involving Antarctic resource use must address and the various models that can be applied in the context of Antarctic living resources.

### *B Sovereignty Defined*

Sovereignty is defined as ‘the plenary competence of a state, or as the totality of the rights and duties of a state which are recognised by international law...which connotes the exclusive right of a state to perform state functions within its own territories.’<sup>332</sup> Central therefore to the notion of sovereignty is the territory within which the state exercises its exclusive sovereign rights. Huber J, in the *Island of Palmas*<sup>333</sup> case said ‘much depends upon which state possesses territorial sovereignty over a given area...if there is no sovereignty over an area, that area inevitably comes under an international regime of some sort.’<sup>334</sup> Davidson describes sovereignty simply as ‘rights of ownership’.<sup>335</sup> The right is earned by a sovereign through the completion of a number of steps defined in international law. First, since territory is central to the notion of sovereignty, a sovereign must have acquired territory. This may be achieved in a number of ways including discovery of territory that is terra nullius (land belonging to no one), the primary mode of acquisition of Antarctic territory to date.

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<sup>332</sup> Triggs, above n 76, 1, 150.

<sup>333</sup> *Island of Palmas* (1928) 2 RIAA, 829.

<sup>334</sup> *Ibid.*

<sup>335</sup> J Scott Davidson, ‘Antarctic Legal Issues: An Introduction’ (Paper prepared for the University of Canterbury Antarctic studies course, Christchurch, 1999).

Simply discovering a territory however is not enough, and today, the most problematic of issues surrounding territorial claims to Antarctica regard whether claims based on discovery have actually been perfected. Discovery of territory only provides an inchoate title<sup>336</sup> to the territory at best; effective occupation of the territory is then required<sup>337</sup> to perfect that title. There has been much debate surrounding the concept of effective occupation<sup>338</sup> and what that phrase actually means, especially in the context of the vast, remote and harsh environment of Antarctica.

The United States, a non-claimant state but an active player in the Antarctic Treaty area, developed a stance of non-recognition of the Antarctic claims on the basis that effective occupation was a necessary requirement to perfect any sovereign title and this had not been achieved. This has constantly been their position<sup>339</sup> even though they themselves reserve the right to make an Antarctic territorial claim in the future, based on acts similar to those made by the current claimants and supported by occupation at the numerous US Antarctic research stations.

It is not the intention of this thesis to debate the legitimacy of the current territorial claims to Antarctica, this has been covered by many authors.<sup>340</sup> The next section is confined to a discussion of the territorial claims that we are currently presented with, that is, the territorial claims situation frozen as at 1961 by Article IV the Antarctic Treaty, and within which we must resolve any legal issues related to bioprospecting in the Antarctic.

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<sup>336</sup> *Island of Palmas* (1928) 2 RIAA, 829.

<sup>337</sup> *Clipperton Island* (1931) 2 RIAA, 1105.

<sup>338</sup> See, eg, *The Legal Status of Eastern Greenland* (1933) PCIJ, Ser A/B, No. 53.

<sup>339</sup> The position of the US was first expressed by US Secretary of State Hughes: 'It is the considered opinion of this department that the discovery of lands unknown to civilization, even when coupled with the formal taking of possession, does not support a valid claim of sovereignty, unless the discovery is followed by an actual settlement of the discovered territory.'

<sup>340</sup> See generally, Triggs, above n 76 for a full discussion of the legitimacy of the Antarctic territorial claims.

### *C Antarctic Territorial Claims*

Antarctica was the last continent to be discovered. While no one argues that Antarctica was terra nullius before its discovery, there is some debate on who actually was the first to discover continental Antarctica. The United States, Russia and the United Kingdom all claim the honour based on discovery expeditions of Nathaniel Brown Palmer (1820), Fabian von Bellinghausen (1819) and James Cook (1773), respectively. Today, Antarctica remains the only continent without a permanent<sup>341</sup> human population and the only land area with unresolved sovereignty.

By 1955, seven states had laid territorial claims to sectors of Antarctica, principally based on discovery. The legitimacy of those claims and the basis for the claims has been debated ever since. Seven states lay claim to seven Antarctic territorial sectors, three of these territorial claim sectors overlap and are mutually contested.<sup>342</sup> All of the seven claims, except one, converge at the south geographic pole and have a northern boundary at the 60° South Latitude line.<sup>343</sup> All but one employ the sector principle<sup>344</sup> to define their territory. A large portion of Antarctica remains unclaimed (Map 1, Appendix 3). In addition to the seven claimant states, two additional states reject all seven of the territorial claims, whilst these also maintain that they each have a legal basis to claim Antarctic territory should they ever wish to do so.<sup>345</sup> To date, none of the claims or basis of claims is recognised internationally, except in some cases by other 'neighbouring' Antarctic claimant states.<sup>346</sup> For most of the rest of the 190-odd states, 'Antarctica is seen as the common heritage of all mankind'.<sup>347</sup>

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<sup>341</sup> While many countries maintain what they refer to as 'permanent bases' in Antarctica, the population of those stations is rotated usually on an annual basis and the majority of these stations are without personnel over the Antarctic winter.

<sup>342</sup> The overlapping claims are those of the United Kingdom, Argentina, and Chile.

<sup>343</sup> Norway does not employ the sector principle to define its claim in Antarctica, preferring to leave the northern and southern extent of their claim undefined. This may effectively create a zone of unclaimed territory at the south geographic pole. Chile does not designate a northern boundary for its Antarctic land-claiming contiguity with the Chilean landmass.

<sup>344</sup> See Triggs, above n 76 for a full discussion of the sector principle; While not a basis of claim to Antarctic territory, states appear to employ the principle as a convenient way to define their boundaries in the south polar region.

<sup>345</sup> The United States and Russia (as recognised successor from the USSR) each maintain a basis for claim.

<sup>346</sup> Australia, New Zealand, France, Norway and the United Kingdom reciprocally recognise the validity of their claims.

<sup>347</sup> Hemmings, above n 190.

While Article IV of the Antarctic Treaty provided the parties with a solution for the duration of the Treaty, it did not solve the problem and so the territorial claims issue remains unresolved. The question as to whether the claims to territorial sovereignty in Antarctica are valid has never been decided upon by international arbitration or adjudication.<sup>348</sup> This is the situation we are presented with and which forms the background for any discussion involving the control and use of Antarctic natural resources.

#### *D Article IV Antarctic Treaty: The Obligation to Compromise on Sovereignty*

As described in Part I of this thesis, Article IV of the Antarctic Treaty dealt with the complicated legal situation regarding territorial claims and sovereignty. Whilst Article IV has been described by many as successful,<sup>349</sup> it did not resolve, nor was it intended to resolve,<sup>350</sup> the complicated territorial claims situation in the Antarctic. It simply froze the legal status quo as at 1961 and deferred the issue<sup>351</sup> for the duration of the Antarctic Treaty. The parties recognized in the late 1950s that it would be the only outcome that all parties might agree to and would therefore allow them to progress with other issues. The bi-focal approach of the article satisfied all the states involved in the Antarctic Treaty negotiations and their varying stances on Antarctic sovereignty. With Article IV, all parties to the Treaty were guaranteed involvement in decision-making on future issues affecting the region.<sup>352</sup> Paragraph 1 is the critical section of the article for the purposes of this discussion and is repeated here. It states:

1. Nothing contained in the present Treaty shall be interpreted as:
  - a. a renunciation by any Contracting Party of previously asserted rights of or claims to territorial sovereignty in Antarctica;
  - b. a renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;

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<sup>348</sup> The United Kingdom in 1947 and 1955 made applications to the International Court regarding the sovereignty dispute arising from the overlapping claims of the United Kingdom, Argentina and Chile. Both Argentina and Chile refused to submit to the jurisdiction of the International Court on this point therefore the situation was not considered.

<sup>349</sup> See, eg, Joyner, above n 65, 58.

<sup>350</sup> Ibid; Joyner argues that criticism of *Antarctic Treaty* article IV presupposes that the sovereignty issue *can* be resolved.

<sup>351</sup> Beck, above n 243, 118.

<sup>352</sup> Lorraine Elliot, *International Environmental Law and Politics: Protecting the Antarctic* (1994) 35.

c. prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's rights of or claim or basis of claim to territorial sovereignty in Antarctica.

This results in no recognised sovereign for Antarctica in its entirety or for any portion of Antarctica. The seven claimant states still maintain the legitimacy of their individual territorial claims and one portion of Antarctica (nearly 20% of the land) has never been claimed and remains unclaimed.<sup>353</sup> The legal operation of any sovereign rights are suspended for the life of the Treaty and no acts or activities by the parties can be used to support or deny a territorial claim. The duration of the Treaty is indefinite.

For the purposes of discussing the legal implications of bioprospecting in the Antarctic, the freezing of the status quo does little to assist in any resolution to the question as to who owns or controls Antarctic living resources that are the focus of bioprospectors. Beeby identified the problem of authority over Antarctic natural resource exploitation as an issue during the mineral convention negotiations and said that, 'Its silence could lead the parties to the Treaty straight back to the central problem of sovereignty and conflicting territorial claims. Who is to authorise the exploitation of the resources in Antarctica and for what area?'<sup>354</sup>

The lack of agreement on the legal status of the territorial claims in Antarctica is 'the centre of the most difficult problems related to Antarctic resources.'<sup>355</sup> Had the controversial territorial claims issue been resolved during the negotiation of the 1959 Antarctic Treaty, the probable result would have been the carving up of the Antarctic continent into at least seven different national territories, all of which today would presumably be under national jurisdiction and control. Cold War conflicts coupled without an Article IV provision could have led to a superpower showdown involving the Antarctic region. Had that been the result, Antarctic resources then would be treated as are all other resources found within a sovereign territory. That is, as a resource to be used for the benefit of the state subject only to outside jurisdiction

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<sup>353</sup> *Antarctic Treaty*, art IV (2) asserts that no new claims to territory can be made by the parties while the treaty is in force.

<sup>354</sup> Beeby, above n 73, 18.

<sup>355</sup> Keith Brennan, 'Criteria for access to resources of Antarctica: alternatives, procedure and experience applicable' in Francisco Vicuna (ed) *Antarctic Resources Policy* (1983) 217, 217.



based on agreements or international treaties to which that state was a party. The discussions surrounding bioprospecting would simply take place at a national level and there would be no further discussion on utilizing the natural resources of the Antarctic for the benefit of all mankind. Therefore, while delaying the question of sovereignty may not be considered an ideal situation to be confronted with, it does allow for an opportunity to treat the Antarctic region and its resources in a special way. Further discussion of this point is presented in subsequent sections of this thesis.

### *E Legal status of Antarctic Marine Areas*

The Southern Ocean is a highly biodiverse zone and therefore a target of Antarctic bioprospectors. In international law, the status of marine offshore zones depends on the legal status of the land adjacent to it. For the Antarctic, the situation regarding territorial claims and the effect of Article IV of the Antarctic Treaty create a complicated jurisdictional situation for the Southern Ocean. In the absence of recognised sovereignty ashore in continental Antarctica, a recognised coastal state or states is absent. As a consequence, it is argued that the high seas extend to the coastline of Antarctica, although most claimant states<sup>356</sup> assert some form of jurisdiction over coastal waters, thus adding a further dimension to any discussions related to marine areas and marine living resources.

As all of the Antarctic territorial claims involve sectors which include a coastal area of the Southern Ocean, each of these territorial claims, if perfected, generates as a right marine off-shore zones.<sup>357</sup> The United Nations Convention on the Law of the Sea<sup>358</sup> (UNCLOS) established that a coastal state has sovereignty over an adjacent

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<sup>356</sup> Email from Trevor Hughes to Michelle Rogan-Finnemore, December 28 2003, notes that as regards New Zealand's position on the legal status of the Ross Sea in the Ross Dependency Region: 'This is a complex issue. Essentially we regard the seas around Antarctica as the high seas, ie international waters. With the other States Parties to CCAMLR we have agreed to conserve and manage the living resources south of the Antarctic Convergence (minus whales which come under IWC) through the Convention. We regard ourselves as having the right, however, under the 1923 Order in Council "providing for the government of the Ross Dependency" and the 1977 Territorial Sea and EEZ Act, to declare an EEZ in the Ross Dependency.'

<sup>357</sup> Note that there is further complication with determining baselines in Antarctica due to the ice that occupies coastal regions there and annual sea ice formation that effectively doubles the size of the Antarctic continent in winter.

<sup>358</sup> *UN Convention on the Law of the Sea*, 21 ILM (1982), 1261 (entered into force 16 November 1994) ('UNCLOS').

territorial sea to a limit of twelve nautical miles.<sup>359</sup> There is also a contiguous zone that extends for a further twelve nautical miles, over which states may exercise limited control.<sup>360</sup> Part V of UNCLOS establishes that the Exclusive Economic Zone (EEZ) extends for up to 200 nautical miles from the baseline of the territorial sea.<sup>361</sup>

Within the EEZ the sovereign coastal state has the rights:

‘for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superadjacent to the sea-bed and of the sea-bed and its subsoil, and with regard to other activities for the economic exploitation and exploration of that zone...’<sup>362</sup>

The sovereignty of the Sub-Antarctic Islands is generally not contested, so that for these islands there are undisputed maritime zones under the control of their respective sovereigns. The unclaimed sector<sup>363</sup> of Antarctica does not generate maritime zones and therefore the marine off-shore area of the unclaimed sector is legally considered high seas.

Although Article VI of the Antarctic Treaty clearly states that the geographic scope of that treaty is the area south of the 60 degrees south latitude, the jurisdiction of the Antarctic Treaty parties within that area is limited by the express saving of the freedom of the high seas and arguably the jurisdiction of the International Seabed Authority.<sup>364</sup> Notwithstanding this high seas express saving, the whole of the Southern Ocean is subject to regulation by CCAMLR, for those state parties to that convention, for the purposes of conservation (including rational use) of marine living resources.

At the time of the negotiation of the Antarctic Treaty in the late 1950s, international law recognised the existence of territorial seas of between three and 12 nautical miles. By the 1980s, when CCAMLR was negotiated, there was recognition of the existence

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<sup>359</sup> UNCLOS, art 2-4.

<sup>360</sup> UNCLOS, art 23.

<sup>361</sup> UNCLOS, art 57.

<sup>362</sup> UNCLOS, art 56 (1) (a).

<sup>363</sup> This ignores the reservation of a basis of claim by both the (former) USSR and United States whose claims might each pertain to the whole of the Antarctic continent.

<sup>364</sup> Triggs, above n 76, 161.

of at least 200 nautical miles of fishing zones and Exclusive Economic Zones. The rights of a coastal state over the continental shelf were first advanced in the US Truman Proclamation of 1945 and were affirmed in 1958 as not depending on occupation, effective or notional, or any express declaration of a coastal state.<sup>365</sup> The International Court of Justice endorsed this view in 1969 stating ‘the rights of the coastal state in respect of the continental shelf...exist ipso facto and ab initio by virtue of its sovereignty over the land.’<sup>366</sup> There is no need for any formal declaration over the continental shelf.

Thus, states claiming sovereignty in Antarctica argued that a fishing zone or an EEZ was a non-severable attribute of such sovereignty.<sup>367</sup> All Antarctic territorial claimants were therefore able to regard their slice of the Antarctic as including control over resources on the seabed and subsoil in at least that area covering up to 200 nautical miles. Australia in particular took the view that to assert a fishing zone<sup>368</sup> would not be an extension of an existing Antarctic claim nor for that matter a new claim by them, but merely the exercise of a function necessarily appurtenant to an existing claim,<sup>369</sup> as any new claim or territorial extension would be in breach of Article IV (2) of the Antarctic Treaty. Non-claimants states have a different view concluding that the general non-acceptance of Antarctic territorial claims means that all offshore marine areas are designated as high seas.<sup>370</sup>

Any Southern Ocean bioprospecting would therefore also involve discussion of Antarctic territorial claims and the sovereignty situation. It is argued that regulation of bioprospecting activities in the Southern Ocean, regardless of the lack of agreement on sovereignty, is already possible within the context of CCAMLR which purports to

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<sup>365</sup> *Convention on the Continental Shelf*, opened for signature on 29 April 1958, 450UNTS 311 (entered into force 10 June 1964) art 2 (3).

<sup>366</sup> *North Sea Continental Shelf Cases* (Netherlands, Denmark v Germany) (1969)ICJ Reports 1969, 3, para 69.

<sup>367</sup> Keith Brennan, ‘Recent International Developments regarding Antarctica’ in Richard Herr, Robert Hall and Bruce Davis (eds) *Issues in Australia’s Marine and Antarctic Policies* (1982) 93; See also, Triggs, above n 76, 225-226.

<sup>368</sup> Australia alone amongst the claimant states does exert an Australian Fishing Zone (AFZ) around its external territories including Antarctica.

<sup>369</sup> Also see Note No 35/2004 of the Permanent Mission of Australia to the United Nations to the Division for Ocean Affairs and the Law of the Sea, 12 May 2004, regarding Australia’s intention to make a submission to the Commission on the Limits of the Continental Shelf for the coast of Australia and its external territories.

<sup>370</sup> MJ Peterson, *Managing the Frozen South: The Creation and Evolution of the Antarctic Treaty System* (1988) 69.

regulate ‘all marine living organisms’.<sup>371</sup> There has also been a suggestion that the International Seabed Authority (ISA) may have a role to play in regulating Antarctic marine bioprospecting.<sup>372</sup> While Antarctica is a unique area in international law, Burke argues that the Southern Ocean shares many of the problems of high seas around the globe.<sup>373</sup> Therefore lessons learned from the negotiations of the UNCLOS may well be of value in the context of Southern Ocean marine bioprospecting whether the parties agree to allow ISA involvement or not. Antarctic Treaty Consultative State parties have not taken the opportunity to discuss these points and it seems unlikely that in a consensus system involving seven claimant states that any agreement could be reached to formally declare all the coastal waters of Antarctica as high seas. The result is that while the Antarctic Treaty is in force, the waters up to the coast of Antarctica are considered high seas.

#### *F Unbalancing the Sovereignty Equation*

Heap believed that ‘balancing sovereignty was the true reason that the Antarctic Treaty was negotiated and that the often cited reasons of promotion of peace and scientific co-operation in Antarctica were actually simply results of the agreement and not its intended objectives’.<sup>374</sup> ‘Fear of chaos’<sup>375</sup> in the Antarctic region was the motive for balancing sovereignty in Antarctica given the political situation<sup>376</sup> at the time of the Antarctic Treaty’s negotiation. This ‘common fear’<sup>377</sup> led to an underlying agreement by the governments concerned, resisting any temptation to implement their particular view of Antarctic sovereignty at that time. Any conclusion of these varying views would have led to rivalry<sup>378</sup> instead of cooperation, which may have led ultimately to international discord in the Antarctic region. The bi-focal approach of the Antarctic Treaty in its wording of Article IV thus allowed for varying interpretations that accord with competing views of state sovereignty in the Antarctic.

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<sup>371</sup> CCAMLR, art 1(1).

<sup>372</sup> Jabour-Green, above n 22.

<sup>373</sup> Burke, above n 108, 82.

<sup>374</sup> Heap, above n 68, 105-106.

<sup>375</sup> Ibid.

<sup>376</sup> Buck, above n 70, 57; According to Buck, the Soviet launch of Sputnik in 1957 was an ‘epiphany’ for the international community. The Soviet success in launching Sputnik made the Southern Hemisphere (in particular) and its allies nervous that the Soviet Antarctic bases would be used to install missiles, putting the Southern Hemisphere countries in range.

<sup>377</sup> Buck, above n 70, refers to ‘the common fear’ of an Antarctic military presence as dwarfing any other internecine disputes related to Antarctica at that time.

<sup>378</sup> Heap, above n 68, 104-105.

This in turn prevented chaos and international discord, by leading to the signing of the Antarctic Treaty. The fear of chaos has arguably subsided and with it there has been a shift in the 'value' of Antarctica, from a strategically valuable area towards first a valuable resource 'treasure island'<sup>379</sup> and more recently as a valuable area for conservation and protection.<sup>380</sup> This shift is not meant to imply a diminishment of the importance of sovereignty considerations for the region, but merely implies that sovereignty considerations can now be addressed in a different arena.

In 1959 most experts estimated that resource extraction from Antarctica was 30 years away.<sup>381</sup> This view meant that the 1959 Antarctic Treaty's focus could be sovereignty and while the Treaty was able adequately to address the signatory parties' sovereignty concerns at that time, the inclusion of a provision for review after 30 years was a signal that parties to the Treaty should be prepared to focus on resource issues in the late 1980s or early 1990s. The 1980s focus on resource regime negotiations<sup>382</sup> did highlight the fact that matters regarding economic use of resources had not been covered. The CRAMRA negotiations in particular highlighted internal and external conflicts that needed to be addressed. These conflicts are still relevant today in the context of bioprospecting. Failure to at least recognise these conflicts may disrupt the system.

### *1 Internal conflicts*

During the CRAMRA negotiations it was noted that any legal solution regarding the use of Antarctic resources would have to include an internal accommodation addressing internal conflicts that existed. That is, it would have to address the varying, diverse views of the individual Antarctic Treaty states. These internal conflicts appeared among Consultative State parties:

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<sup>379</sup> Beck, above n 243, 210.

<sup>380</sup> As evidenced by the ratification of the *Protocol* which designates Antarctica as a 'natural reserve'.

<sup>381</sup> See Peterson, above n 370, 70.

<sup>382</sup> Including negotiations for both *CCAMLR* and *CRAMRA*.

1. Claiming sovereignty and those non-claimants who neither made nor recognised claims;
2. Most of whom were developed nations and those that were least developed or developing states; and
3. Who were likely to directly engage in the activity and those who would not, or who would indirectly participate through the activities of other parties.<sup>383</sup>

During the negotiations of a minerals resource regime Wolfrum notes that it was the first conflict that ‘left its mark on almost every phase of the negotiations.’<sup>384</sup> The two extreme positions which states could have promoted with regard to mineral resources were represented by the claimant states on the one hand, asserting that they alone had the legal competence to regulate mineral resource activities, and the non-claimant states on the other hand asserting that all Consultative State parties had the right to regulate resource activities. These two views represented the extreme positions, so that for the minerals convention to work, the result had to represent an arrangement where the parties could collectively regulate resource activities without jeopardising the claimant states rights. The successful negotiation of CRAMRA was an indication that the convention was able to address these extreme positions. However, its subsequent failure meant that its effectiveness cannot now be measured.

Such internal conflicts still exist. The increase in the number of Antarctic Treaty parties even since the minerals negotiation continues to shift the balance underlying these issues. Any discussions regarding bioprospecting in Antarctica will once again have to take into consideration the varying views of the Antarctic Treaty parties and address these external conflicts.

## 2 *External conflicts*

On some subjects, the interests of the Consultative State parties are aligned with or identical to those of the international community. Some examples of such interests would include non-nuclear use and non-militarization of the region, freedom of scientific investigation and environmental protection of Antarctica and the Southern

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<sup>383</sup> See Wolfrum, above n 130, 13; See also, Gillian Triggs, ‘Negotiations of a Minerals Regime’ in Triggs (ed) *The Antarctic Treaty Regime: Law, Environment and Resources* (1987) 182, 187.

<sup>384</sup> Wolfrum, above n 129, 13.

Ocean. Other interests are at times at odds with the international community. Wolfrum noted one such example during the CRAMRA negotiations saying that the interest in the utilization of resources was at odds with the international community and this external conflict rendered the situation much more complex.<sup>385</sup> The international community wishing to see Antarctic resources utilised for the benefit of the global community and not simply for Antarctic Treaty Consultative states only.

Since the negotiation of the Antarctic Treaty, the international community has questioned the legitimacy of conducting resource-related negotiations only among the Consultative State parties. In the 1980s in the context of the CRAMRA negotiations, two additional external conflicts were added to the situation. Firstly, there was access for the wider community to any Antarctic resource regime; and secondly, there was the distribution of any benefits to the wider community.<sup>386</sup> With sovereignty issues unresolved in the Antarctic region a basic legal question which impacts on Antarctic bioprospecting discussions concerns *who* is entitled to be endowed with the legal capacity to dispose freely of natural resources from Antarctica?<sup>387</sup> Note that ‘dispose of’ includes the right of exclusion, utilisation and derivation of any benefit from the natural resource. Any discussions involving regulation of living resources from the Antarctic will need to address and accommodate similar external conflicts. This is especially true in regard to the two new external conflicts because, with CRAMRA abandoned, there has yet to be exploitation of Antarctic resources outside marine fisheries.

Failure to address these conflicts may damage the reputation of the system in the eyes of the international community, the reputation of which was recently strengthened by the ratification of the Protocol. It also creates political tension internally amongst the Antarctic Treaty parties. Arguably the claimant states do not wish to see their status in Antarctica eroded and any major disruption to the system could well see the Antarctic Treaty System Consultative State parties withdrawing, so that they have an opportunity to formalise and legitimise territorial claims or in the case of non-claimant states to openly guard against such claims. The feasibility of bioprospecting

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<sup>385</sup> Ibid 15; Wolfrum was referring to non-living resources but the general sentiment applies to living resources.

<sup>386</sup> Ibid.

<sup>387</sup> Nicholas Schrijver, *Sovereignty over Natural Resources* (1997) 7.

in the Antarctic region makes the situation different from that of minerals exploitation, because mineral exploitation was not actually occurring nor feasible at the time of the CRAMRA negotiations. At that time, claimant states had nothing real in economic terms to lose in negotiating a regime. Bioprospecting is a feasible commercial activity. Therefore, it has greater capacity to disrupt the system.

### *G A Sovereign's Rights over Natural Resources*

The genesis of the concept of sovereignty over natural resources as a principle of international law developed in the post World War II<sup>388</sup> period. The United Nations General Assembly promoted the concept, which was advocated by developing countries which sought to secure benefits from their natural resources. While environmental awareness has introduced a balance of duties along with sovereign rights, the general principle of a state's sovereignty over natural resources remains, that is, international law currently provides that it is the sovereign state that has the right to exploit its natural resources, subject to certain obligations relating to environmental protection.<sup>389</sup> The CBD reaffirms this sovereign right over resources.<sup>390</sup>

While claimant states continue to maintain that they have a legitimate basis of claim to territory in Antarctica, provisions of the Antarctic Treaty represent substantial abatements of the normal attributes of sovereignty.<sup>391</sup> These abatements include granting freedom of scientific investigation to anyone, anywhere in Antarctica, allowing the building of a scientific base or bases anywhere in Antarctica and the prohibition of military activity south of 60° south latitude. Yet, while the issue as to sovereignty remains unresolved, the territorial claimants continue to maintain their claims and only New Zealand, alone amongst the claimants, has ever offered to abandon its territory and therefore cede all sovereignty rights.<sup>392</sup> So while we cannot say for certain who the sovereign, or sovereigns, are over Antarctic Treaty territory,

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<sup>388</sup> Ibid 3.

<sup>389</sup> See UNGA Resolution 1803 XVII *Declaration of Permanent Sovereignty over Natural Resources* (1962).

<sup>390</sup> *CBD*, art 3.

<sup>391</sup> Keith Brennan, 'Recent International developments regarding Antarctica' in Richard Herr, Robert Hall and Bruce Davis (eds) *Issues in Australia's Marine and Antarctic Policies* (1982) 92, 92-95.

<sup>392</sup> See Beck, above n 243, 131.



we also cannot say that the region is beyond national jurisdiction as seven Antarctic Treaty nations continue to maintain their territorial claims. So the Antarctic Treaty parties, and especially the Antarctic territorial claimant states, maintain that they have the right to regulate Antarctic resource use under Article IX of the Antarctic Treaty.

Because of the Antarctic Treaty and the operation of the Antarctic Treaty System, permanent sovereignty over Antarctic resources does not rest with the claimant states as individual sovereigns over the region. While the consultative states act collectively as a group making decisions concerning the region, they do so within the confines of the Antarctic Treaty System. Therefore the model of permanent sovereignty over natural resources cannot strictly apply to the natural resources of the Antarctic region and while the CBD supports international law and reaffirms a sovereign state's right to control its natural resources, there are emerging views regarding property rights associated with resources that oppose this model and which may better suit the Antarctic situation. These models are discussed below.

#### *H Alternative Property Right Models over Natural Resources*

Roman law generally recognised four property regimes: *res nullius*, where the resource in question belongs to no one; *res privatae*, where the resource in question belongs to one or more individuals; *res publica*, where the government holds the resource for the benefit and use of the public; and *res communes*, where the resource is accessible to any user, but cannot be exclusively acquired.<sup>393</sup>

The *res communes* regime or the common property doctrine, as it is now more commonly referred to, extends to most of the living resources of areas beyond national jurisdiction, which are open to legitimate and reasonable use by all states and may not be appropriated to the exclusive sovereignty of any one state.<sup>394</sup> Additionally there are some resources that are considered the common heritage of mankind (CHM) and calls for the CHM principle to be applied to other resources. The CHM principle is not the same as the common property doctrine, namely, the CHM is a more recent

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<sup>393</sup> See generally, Buck above n 70, 2-4; Joyner, above n 65, 25-35.

<sup>394</sup> See Birnie and Boyle, above n 237, 141-143.

concept which only applies to certain non-living resources.<sup>395</sup> However, recently the CHM approach has been broadly, though not correctly, applied to all resources beyond national jurisdiction. For this reason both concepts are considered below separately.

### *1 Common Property Resources and the Global Commons*

Common property, or common pool resources, are said to be located in resource domains known simply as commons. Global commons are large resource domains which are not exclusionary - an example would be the high seas region. Joyner notes that certain factors should be considered in deciding whether a domain qualifies as a global commons. He states these factors include: circumstances regarding delimitation of the area; the degree of national legitimacy, sovereign claims and jurisdictional reach within the area; the extent of control and regulation over the area; the degree of access granted; distribution of costs and benefits; and decisions concerning conservation or exploitation of the area.<sup>396</sup>

Antarctica has been described as an international commons,<sup>397</sup> a disputed commons,<sup>398</sup> and Joyner states (with the criteria above in mind) that 'the natural and legal situation of the Antarctic plainly intimate that the region qualifies as a global commons area.'<sup>399</sup> The unresolved nature of the territorial claims is the sticking point in any declaration that the region is a true global commons, even though overwhelming the international community does not recognise the territorial claims. According to Buck, Antarctica is, at best, 'an international commons rather than a global commons, because membership in the governing system for the Antarctic region is limited and it is therefore exclusionary.'<sup>400</sup> She notes, however, that it shares many attributes of a global commons. Joyner goes further and states that:

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<sup>395</sup> Ibid 143-144; See also discussion below.

<sup>396</sup> See Joyner, above n 65, 25.

<sup>397</sup> See, eg, Buck, above n 70.

<sup>398</sup> See Ruben P Mendez 'Ocean governance and development: The question of funding' in Peter Payoyo (ed) *Ocean Governance: Sustainable development of the seas* (1994).

<sup>399</sup> Joyner, above n 65, 44.

<sup>400</sup> Buck, above n 70, 14.

‘so long as the parties comply with the [Antarctic Treaty] provisions, the Antarctic can be viewed legally as lying beyond limits of recognised national jurisdiction...as long as the Antarctic Treaty remains a functioning legal instrument, the Antarctic can be viewed legally as beyond the limits of recognised national jurisdiction...and therefore the Antarctic region is part of the global commons.’<sup>401</sup>

This is clearly a contentious statement because of the seven territorial claims. Were it not for the territorial claims to Antarctica it is probable that the living natural resources of the Antarctic region might be regulated under the common property model today, and Antarctica would be recognised as a true global commons. The continued maintenance of the territorial claims precludes the strict application of this model, even though the legal operation of these claims is held in abeyance by the Antarctic Treaty while it is in force.

Advocating for a global commons models has certain disadvantages as well, often overlooked by the international community. There is of course the ‘tragedy of the commons’ as postulated by Hardin.<sup>402</sup> In his tragedy of the commons scenario, a communal pasture is open to all for grazing of their cattle. For each individual herdsman who wishes to exploit the pasture, there is every reason to add cattle to his herd. The pasture is limited, so that if each herdsman adds cattle, then, at some stage, the carrying capacity of the pasture is exceeded. The pasture is overgrazed and destroyed. The commons idea carries with it an implication that the resources of the area are there to be used and does not promote the idea of protection of the intrinsic and wilderness values of a place, like declaring an area as world park or natural reserve would. These disadvantages must be borne in mind when considering a property model for the use of living resources.

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<sup>401</sup> Joyner, above n 65, 53.

<sup>402</sup> Garret Hardin and John Baden (eds), *The Tragedy of the Commons* (1977).

## 2 *Res communes humanitatus, Antarctica?*

Often because of the unresolved nature of the territorial claims, Antarctic resources are referred to as the common heritage of mankind.<sup>403</sup> Birnie and Boyle note that although the term common heritage is used loosely to refer either to all resources of nature, living and non-living, or to the global environment as an ecological entity, for legal purposes the term is only narrowly defined by the meaning given to it in two conventions,<sup>404</sup> viz the 1979 Moon Treaty<sup>405</sup> and the 1982 UNCLOS.<sup>406</sup> As expressed in both these conventions, the concept of common heritage of mankind implies that the non-living resources of these areas, areas that are beyond national jurisdiction, ‘cannot be appropriated to the exclusive sovereignty of states but must be conserved and exploited for the benefit of all, without discrimination.’<sup>407</sup>

Arvid Prado in 1967 advocated what he termed the ‘Common Heritage Principle’ being ‘resources are the property of the global human population, whose benefits should be shared by all states, and should be distributed to all people, regardless of the states participation in the resources extraction.’<sup>408</sup> Importantly, the concept differs from common property, in that it allows for all states to share in the benefits even if they are unable to participate in the process of extraction and exploitation.

In regard to Antarctic living resources as common heritage of mankind, three important points must be made. Firstly, the 1982 UNCLOS did not apply the common heritage regime to the waters above the deep seabed nor to the living resources found anywhere in the oceans. This clearly has implications for the marine living organisms of the Southern Ocean in the context of bioprospecting, because currently the living resources of the Southern Ocean are not considered common heritage resources. Secondly, the Protocol as the most recently adopted and most

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<sup>403</sup> See, eg, Buck, above n 70, 64-66; See Joyner, above 65, 32-33.

<sup>404</sup> Birnie and Boyle, above n 237, 143.

<sup>405</sup> *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, opened for signature on 1979, (entered into force on 11 July 1984) (*‘Moon Treaty’*).

<sup>406</sup> *UN Convention on the Law of the Sea*, 21 ILM (1982), 1261 (entered into force 16 November 1994), arts 136, 137 (*‘UNCLOS’*).

<sup>407</sup> Birnie and Boyle, above n 237, 143.

<sup>408</sup> Note verble, 17 August 1967, Permanent Mission of Malta to the UN Secretary General, UN Document A/6095.

comprehensive environmental protection regime for the Antarctic and its dependent and associated ecosystems, notes that a comprehensive protection regime is ‘in the interest of mankind as a whole’. It did, however, avoid direct analogy with the Moon Treaty and UNCLOS even though it had the opportunity to consider both of these agreements which deal with resources beyond national jurisdiction. This may imply a deliberate intention to exclude the resources of the Antarctic region as common heritage of mankind. Finally and perhaps critically, the territorial claims and the nature of disputed, but persistent, sovereignty claims means that the Antarctic Treaty region is not strictly a region beyond national jurisdiction and that common heritage of mankind considerations have been reserved to non-living resources that are beyond national jurisdiction.

While a case may be made that the resources of the Antarctic region should be made the common heritage of mankind, such a view remains controversial and does not take into full account the complex legal and political arrangements for the region.<sup>409</sup> Any definitive statement regarding Antarctic living resources as common heritage would require that benefits derived from operations such as bioprospecting should be for the benefit of all mankind, not simply for the Antarctic Treaty states, Antarctic Treaty Consultative states, Antarctic territorial claimants or for those states which actively participate in the exploitation of the resource.

Generally, developing countries view all genetic resources as part of the common heritage of mankind.<sup>410</sup> There have also been recent initiatives to declare all biodiversity on Earth as the common heritage of mankind. An example can be found with the Treaty Initiative to Share the Genetic Global Commons (TISGC)<sup>411</sup> a proposal promoted primarily by NGOs who were against the private ownership of genetic resources. This initiative was released publicly in February 2002 at the World Social Forum and was proclaimed as an alternative to the CBD. Its intention was to declare the Earth’s gene pool as a new global commons. While the initiative has since disappeared from view and is unlikely to be formally presented or adopted in the near

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<sup>409</sup> Birnie and Boyle, above n 237, 144.

<sup>410</sup> Vandana Shiva ‘Biotechnological development and the conservation of biodiversity’ in Vandana Shiva and Ingunn Moser (eds) *Biopolitics: A feminist and ecological reader on biotechnology* (1995) 193, 209.

<sup>411</sup> See, eg, ‘The Launch of the Porto Alegre Treaty to Share the Genetic Commons’ Feb 2002, World Social Forum.

future, such an initiative would have included the biodiversity found in Antarctica and the Southern Ocean.

What the emergence of such new initiatives and changes in thinking mean for areas beyond national jurisdiction or simply for the Antarctic region which maintains its unresolved sovereignty status, is unclear and requires investigation. It is probable that any new attempt to declare Antarctic resources as common heritage would see Antarctic Treaty Consultative State parties claim to be the exclusive custodians of the resources with ultimate responsibility for governance in the Antarctic. This approach was reflected in, for example Recommendation VIII-8 on 'Activities of States that are not Consultative Parties'. While the recommendation reaffirms the Antarctic Treaty Preamble sentiments that it is 'in the interests of all mankind' to govern the Antarctic, it also recognises and places a special responsibility on Antarctic Treaty Consultative parties, a view reaffirmed in both CRAMRA and the Protocol.

The Antarctic Treaty Consultative State parties have blocked external initiatives in the past. As, for example in 1974, when the proposal by the Food and Agricultural Organisation (FAO) for a ten year Antarctic marine living resources programme to utilize resources in the Southern Ocean for the benefit of the world as a whole and developing nations in particular<sup>412</sup> was blocked.

Before the negotiations of CRAMRA began, it was said that the Consultative Parties were signalling greater flexibility, reflected, for example, in their decision to allow expert groups like the United Nations Environment Programme to become observers in the ATS. Referring to this increase in flexibility, Wolfrum in answer to the question 'Who is going to profit from the utilization of Antarctic mineral resources', said that 'it would be the claimant states, the non-claimant states and the world community.'<sup>413</sup> Whether this would have been true or not is impossible to decide now that CRAMRA has been abandoned. However, the same question will undoubtedly be asked in the context of Antarctic bioprospecting.

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<sup>412</sup> Rudiger Wolfrum, 'The Use of Antarctic Non-Living Resources: The Search for a Trustee?' in Rudiger Wolfrum (ed) *Antarctic Challenge* (1983) 143, 160; See Auburn, above n 74, 127-128 for discussion of the FAO Southern Ocean Fisheries Survey Programme (SOFSP).

<sup>413</sup> Wolfrum, above n 412, 163.

*I Declaring Antarctic Biodiversity as a Global Commons: An Opportunity for the Antarctic Treaty System?*

Perhaps at least for the duration of the Antarctic Treaty and while the seven territorial claims exist, there can never be full and formal agreement that the Antarctic is in fact a global commons. If we can accept for the moment, however, that the regulation of the use of any living resource from the Antarctic region should become a special case, that could be managed as if it were a global commons resource, we can begin to contemplate what is necessary to make it so in practice, by developing a management and regulation regime which truly reflects this special status for the benefit of all mankind.

Even those wearing rose-coloured spectacles could imagine that realising this would be difficult to achieve. It does, however, provide the Antarctic Treaty System with a unique opportunity to: 1) promote its credibility and 2) allow consideration of points that any global commons regime would require, for example, open access and benefit-sharing, which are considered below.

*I Open access*

The CRAMRA negotiations highlighted access to resources as an important consideration for both the exploiter of the resource and as an internal conflict that would require accommodation. Access also requires consideration in the context of living resources. For bioprospecting, access involves the initial opportunity to the living resource on the continent and in the Southern Ocean, and may also include repeated access to any compound or gene that can not be synthesised in a laboratory. In the case of sovereign states, access to an area's resources are state controlled. In the global commons model, access to resources would be open, that is, access for all states, even those states outside of the Antarctic Treaty System. Bush argues that the Antarctic is 'closer to an open access model...than to one of territorial control'<sup>414</sup>, so one of the tools for a true global commons model may already be in place. Care must be taken, however, as generally with open access models the prognosis for sustainable resource use and protection of the environment is poor. This is evidenced in the

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<sup>414</sup> Bush, above n 247, 135.

Antarctic region by the results of whaling, sealing and fishing, which have all resulted in unsustainable harvesting of many species and the increased mortality of by-catch. Arguably with the comprehensive protection of the Protocol now in place the risk of severe impacts on the environment is less likely.

For bioprospecting, access does not necessarily have to mean physical access to the Antarctic region, and in general, does not require access to the majority of the region. Biodiversity can be catalogued and listed in a physical repository or within a database. The Bonn Guidelines recognise the usefulness of databases as the repository of biodiversity information, proposing the development of databases for the purpose of information sharing. In any Antarctic biodiversity global commons there would be a requirement for all samples of Antarctic biodiversity to be catalogued and collected in an Antarctic biodiversity database. The information and samples contained therefore would be accessible and available to everyone. Their use would reduce the impacts to the environment, create a mechanism for information sharing and act as a resource in itself. While the usefulness of such a database is acknowledged, it is also recognised that the creation and maintenance of an Antarctic biodiversity database would be a mammoth undertaking, especially given the need for it to include micro-organisms and marine species.

## 2 *Benefit-sharing*

Although this thesis focuses on the legal implications of bioprospecting in the Antarctic, the issue is also surrounded by important and difficult ethical implications and considerations. The ethical considerations have been outlined by Alistair Graham.<sup>415</sup> Creating innovative legal solutions for bioprospecting in the Antarctic has the potential to address these important ethical concerns and presents a radical opportunity for the Antarctic Treaty System. In the strict definition of CHM, benefits from non-living resources are derived for the benefit of all without regard to who actually participates in the exploitation or development of the resource. While it is realised that the CHM principle applies only strictly to non-living resources, consideration is given to the objects and purposes of this principle in the context of

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<sup>415</sup> Alistair Graham, 'Environmental, ethical and equity issues posed by Antarctic bioprospecting', (Presentation at the Bioprospecting in Antarctica Workshop, April 2003, Christchurch).



Antarctic living resources that may be utilized for bioprospecting. In any approach to resources, the benefit-sharing<sup>416</sup> is an area that requires consideration in the context of the Antarctic Treaty System. There are differing interests of stakeholders and broad implications in the word ‘benefit-sharing’.

### 3 *Who are the stakeholders?*

Within a sovereign state generally, benefits from bioprospecting within its territory accrue to that state primarily for the benefit of its people. Also benefits should be equitably shared between the parties involved in the bioprospecting. In countries where there is an indigenous population and where a discovery is based upon traditional knowledge of the resource, the parties involved include the indigenous people of the region. As Antarctica has no indigenous population, no question surrounding traditional knowledge and indigenous culture, and intellectual property arise and the list of stakeholders cannot include an ‘Antarctic citizen’. The list of stakeholders clearly includes the seven territorial claimant states, the other Consultative State parties and the Non-consultative State parties to the Antarctic Treaty. If there are, however, to be provisions for a global commons arrangement, the list of stakeholders would include the remaining UN member states, which are currently outside of the Antarctic Treaty System.

For any regime to be truly for the benefit of all mankind and not merely for the members of the ‘cosy club’, any regulation of bioprospecting should be developed to include not only any economic benefit, but also social benefit. These range from technology sharing, capacity-building, education, free or improved access to medications, agricultural and pharmaceutical products, to name only a few. Beyond improved or free access to products, the ATS has considerable experience with initiatives involving capacity-building and technology transfer between Antarctic Treaty states. Developing guidelines to improve and maintain this initiative and extend that work to non-treaty states would be a great improvement on the system and would dispel many external conflicts that might arise.

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<sup>416</sup> New Zealand, above n 199, 8.

What this envisions is that all Antarctic biodiversity samples would be processed and catalogued without leaving Antarctica. The information would be placed on the database by individuals learning the process. The training would target those from developing states so that the knowledge gained would be taken back to those countries. Funds derived from benefit-sharing provisions in bioprospecting contracts would be invested by the ATS and this investment would be the basis of a capacity and technology building fund for developing states. Any contracts related to the use of Antarctic biodiversity must include provision amongst the parties involved, must deliver a benefit back to the Antarctic via the Antarctic Treaty System and must include a benefit that is invested or delivered to the global community. The samples and the database itself would be the resource and would be managed as common heritage of mankind. Such an approach synthesises the arguments for a biodiversity global commons and Antarctic global commons by creating an ‘Antarctic Biodiversity Commons’.

#### *J Summary*

Hanessian hoped that Article IV of the Antarctic Treaty would ‘ultimately permit the claims issue to die a natural death.’<sup>417</sup> While Article IV has effectively ‘frozen’ the disputes over territorial claims, the claims issue has not died away. Rather, it lies dormant, awakening when a new political and legal issue emerges - including those instances regarding the utilization of Antarctic resources. So that the issue of sovereignty continues to be of critical consideration, as it was in the minerals debate<sup>418</sup> and certainly as it will be regarding bioprospecting. While Article IV does not solve the sovereignty dispute, it does in fact provide all parties with a solution, for the duration of the Antarctic Treaty, as regards the complicated territorial claims situation. It provides, at the very least, interim stability in the region and the basis for a management framework. It may, however, lack legitimacy in the long term and the seven territorial claims may never formally be recognised as legitimate in international law.

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<sup>417</sup> John Hanessian, ‘The Antarctic Treaty 1959’ (1960) 9 *International and Comparative Law Quarterly* 436, 470.

<sup>418</sup> See Triggs, above n 76, 150.

As with the minerals regime, negotiation of any bioprospecting regime will require ATCPs to pursue particular common and conflicting interests. Living resource exploitation in Antarctica may revive the dispute over sovereignty, something held in abeyance by Article IV of the Antarctic Treaty. Antarctic Treaty Consultative parties had previously recognised this potential, so that the Article IV protection is already included in other system instruments related to living resources. CCAS, for example, affirmed Article IV of the Antarctic Treaty, while CCAMLR reiterates the provision and adapts it for the marine environment. CRAMRA would have also included Article IV protection in relation to mineral resources. For CRAMRA, theoretically two extremes existed for resource activities administration in Antarctica: (1) Territorial claimant states could have argued that they have the legal competence to regulate and control resource related activities (to the satisfaction of CRAMRA); (2) Non-claimants argued that all Antarctic Treaty parties have the right to undertake that task.

Faced with the prospect of having to negotiate a regime to deal with mineral resource exploitation in Antarctica, these problems were not unlike those which were faced in the negotiation of CCAMLR, but they were more difficult.<sup>419</sup> That difficulty was centred on unresolved sovereignty. With mineral exploitation there was a need to provide a means by which an exploiter could be given security of title, both to the extraction site and to the product. The same is true for title to Antarctic-derived products or processes.

Since the signing of the Antarctic Treaty legal and political contexts have affected the evolution of management regimes<sup>420</sup> for areas such as the Antarctic region, an area that some believe should be managed as a global commons. Ideas regarding international governance have also changed significantly, so that any reconsideration of sovereignty in the Antarctic must include consideration of the emergence of these new concepts.

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<sup>419</sup> Keith Suter 'A Public Policy Problem for Australia in the 1980s' in Richard Herr, Robert Hall and Bruce Davis (eds) *Issues in Australia's Marine and Antarctic Policies*, 101, 113-128.

<sup>420</sup> Buck, above n 70, 2.

Exploitation, ownership and distribution of any benefits derived from the natural resources from Antarctica challenge the isolation of 'frozen' sovereignty, with implications for peace and international scientific co-operation in the region under the Antarctic Treaty System. This in effect may be a resurrection of the 'fear of chaos' or even chaos itself as proposed by Heap. Sovereignty in the Antarctic therefore, is of fundamental importance to any legal solution affecting bioprospecting in the Antarctic.

## IV THE FUTURE OF ANTARCTIC BIOPROSPECTING

### *A Introduction*

Part IV of this thesis considers the future of bioprospecting in the Antarctic. It begins by summarizing the legal implications of allowing the activity to continue in the region; it then discusses whether a moratorium is appropriate, or even possible, at this stage; and finally it investigates options for regulation.

Regulation may be achieved in a number of ways. First, by utilizing and applying the tools that are already available within the constructs of the Antarctic Treaty System. Presently all bioprospecting in the Antarctic is being carried out under the umbrella of the legal instruments and guidelines that were drafted to address entirely different purposes, with the exception of the rules laid down under the Protocol which was designed to address *all* human activity in the Antarctic. While the instruments on the whole may not be applicable to bioprospecting, many of these instruments contain articles, approaches or objectives that are also important for bioprospecting regulation - these are identified and presented in this chapter.

If bioprospecting is to continue in the Antarctic, however, and if it is to be for the benefit of all mankind, consideration must be given to a new regulation for the activity, which would address the legal implications particular to bioprospecting, as presented throughout this thesis. So that, it will be necessary to create either a legal instrument dealing generically with Antarctic resource utilisation, including specific bioprospecting provisions, or a bioprospecting instrument that may act as a precedent for other Antarctic resource related regulation. The final section of this chapter presents key provisions for a bioprospecting convention taking the latter approach. The successful negotiation and completion of such an instrument, regardless of which approach is adopted, may, however, be difficult or impossible to achieve, and may be discouraged by environmentalists and the international community for the same reasons that CRAMRA was opposed. That is, because any convention which regulates Antarctic bioprospecting may, in fact, provide the certainty required to encourage and promote, and thereby expand, the activity.

## *B Legal implications: a summary*

Parts I, II and III of this thesis have investigated the legal implications of bioprospecting in the Antarctic region. The key points presented, and summarised here, indicate that there are at least five fundamental legal issues that must be considered.

The two most important legal implications of bioprospecting surround:

1. The obligation for the free availability of observations and results; and
2. The questions surrounding the unresolved nature of Antarctic sovereignty and benefits from, access to and utilization of resources.

First, the exact nature and extent of the obligation under Article III (1) (c) of the Antarctic Treaty, to make freely available scientific information and results from Antarctica, is unclear and requires resolution. In the case of bioprospecting, Antarctic Treaty parties must clarify whether IPR devices, such as patents, are acceptable in regard to an Antarctic product or process. It is also important to determine whether the maintaining of trade secrets is legally appropriate and whether external international obligations pose additional obligations to those found within the Antarctic Treaty System itself in relation to Article III.

Second, the obligation to freeze the legal operation of sovereign rights associated with the territorial claims to Antarctica found in Article IV of the Antarctic Treaty and repeated in many of the major Antarctic Treaty System instruments requires careful consideration. Specifically, the nature of the situation in the Antarctic invites legal challenges from the international community involving ideas concerning a sovereign's legal right to exploit the natural resources within its territory. Uncertainty over the precise nature of the obligation may invite internationalism, once again, into the Antarctic arena. The lack of a recognised sovereign, or sovereigns, means that any regulation regarding natural resources from Antarctica or the Southern Ocean must be developed carefully, must address the internal conflicts that exist among state parties and must address external conflicts from an international community that does not

support the territorial claims to any part of Antarctica. This will certainly involve clarification of both global commons and common heritage of mankind issues.

Closely, or perhaps intricately, related to the sovereignty issue, is benefit-sharing. Benefit-sharing is such an important legal issue in the context of the exploitation of Antarctic resources, however, that it should be considered as an issue in its own right. Any legal considerations given to benefit-sharing in the context of bioprospecting will also have implications and applications to future Antarctic resource issues. Within a sovereign state, resources are utilized for the benefit of the people of that state. Where there are commercial opportunities, any commercial benefits from the development of a product or process are generally given to the parties involved in the development. For Antarctic bioprospecting, there is an expectation from the international community that any benefits derived from the Antarctic region should be for the benefit of all humankind. This must be balanced against the strict application of the sovereign principle and the views of the territorial claimant states in particular.

In addition to these critically important legal implications are secondary legal considerations, including the lack of a formal legal definition-which will require negotiation, development and acceptance (by consensus) by Antarctic Treaty consultative states of a definition of bioprospecting; the lack of legal clarity surrounding the extent of the meaning of peaceful purposes objective of Article I of the Antarctic Treaty-which will require consideration of whether commercially driven activities breach this objective, given their potential to lead to international discord in the region.

In addition to the legal implications, there are environmental and ethical considerations which are also important. While these issues were not considered in any detail in this thesis, each also carries with it a legal implication, or implications, of its own. As far as the environmental issues are concerned, it appears that the current level of Antarctic bioprospecting is causing no more than a minor or transitory impact on the environment. Increased levels of activity, however, may result in increased impact. Worse yet, bioprospecting could result in sudden irreversible impact from an environmental accident. The Protocol appears to be able to manage bioprospecting as it currently stands. Without a liability regime in place under the

Protocol, it would, at this stage, be impossible to prosecute or punish those responsible for any environmental damage caused by bioprospecting in the region. It therefore seems imperative that the liability annex to the Protocol be fully and finally negotiated, accepted and adopted by all Antarctic Treaty states as soon as possible. There is some anticipation within the Antarctic community that this may occur in the very near future.

The ethical considerations are embedded in the arguments surrounding benefit-sharing. A legal solution is required not only to distribute any economic benefits which may arise from Antarctic bioprospecting, but may also be required to define the range of other benefits, including social benefits, which may also be a result a successful commercial application. There are also ethical considerations involved simply in the use of biodiversity, these are already being considered by the international community.

### *C Review of Antarctic Bioprospecting Activities*

In the Information Paper presented at the 2004 Antarctic Treaty Meeting in South Africa, it was suggested that the first step the Antarctic Treaty Consultative State parties should take, is to carry out an extensive review of bioprospecting in the Antarctic.<sup>421</sup> The review should include quantifying the commercial value of the research on Antarctic biodiversity and should include consultation with the commercial organisations that are involved. The paper went on to note that important review aspects include whether the holders of the approved patents collected their samples from Antarctica or relied on ex-situ collections, how companies access collections and assert their right to use them, and how any benefits have been distributed. This type of information needs to be known before the Antarctic Treaty parties can consider the regulation of bioprospecting. The Information Paper advocated for the commercial organisations involved in Antarctic bioprospecting to be included in the policy-making process to avoid suspicion, doubt and resistance.

While a review sounds like a logical start, it is not only the commercial organisations involved which should be surveyed, as bioprospecting is being carried out within

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<sup>421</sup> UNEP, above n 213.



National Antarctic Programmes. Antarctic Treaty states are obligated to exchange information on their research programmes, so that, any review should begin by gathering information on bioprospecting research from these exchanges or from National Antarctic Programmes themselves. Some National Antarctic Programmes have openly reported on science events which focussed on bioprospecting, other national programmes have not reported such activities. This is either because none are being carried out within their programmes, or perhaps because the programmes are themselves unaware that the research being carried out is part of bioprospecting itself. It may also be because Antarctic bioprospecting groups may be relying on samples that are ex-situ and were extracted for another purpose. It may be difficult to ever fully understand the extent of this type of bioprospecting activity. It may even be that some National Antarctic Programmes may not wish to disclose bioprospecting-related events and activities for whatever reason. An attempt should however be made to review the current level of bioprospecting-related work being undertaken within National Antarctic Programmes, even if the review cannot identify specific events and research organisations involved, but could provide an overview of the current level of activity, how that activity was undertaken, what funding sources were used and if any benefits have been derived. This would provide the transparency that is required to successfully operate within the Antarctic Treaty System.

#### *D Moratorium*

As with early mining discussions there has been little discussion in principle on whether bioprospecting activities *should* be allowed in the Antarctic region. Unlike the mineral discussions, however, bioprospecting in the Antarctic is already occurring, so that any agreed moratorium would require a halt in any bioprospecting currently being undertaken. When the Protocol was negotiated, the idea of a permanent moratorium on mineral exploitation was an easy one to embrace. This is because at the time of those discussions, even though exploration was taking place, mineral resource exploitation and extraction were not technically nor economically feasible, and, as a result, were not taking place in the Antarctic region.

When the CRAMRA initiative failed, the crisis that the failure presented meant that a continuing moratorium of mineral resource utilization would be the only solution. It

resulted in the protection of the environment that was lobbied for and it rendered the sensitive sovereignty issue redundant insofar as a 'delimitation in relation to mineral rights was no longer required'.<sup>422</sup> A moratorium on bioprospecting would, for the time being, place the sovereignty issue once again on the back burner. Perhaps, however, it is time to give full consider to whether territorial claims in Antarctica can (or should) ever be perfected.

For bioprospecting it is unlikely, given that it is already occurring in Antarctica and the Southern Ocean, and given its resemblance to other scientific research that are part of National Antarctic Programmes, that any moratorium could now be effectively imposed. There would undoubtedly be subsequent problems associated with adequately policing and enforcing of such a ban. Any samples that have already been legally extracted from Antarctica and the Southern Ocean could still be used for commercial development without breaching even a moratorium on extraction from Antarctica, as the samples are already part of national and private collections scattered throughout the world. Without any contract or formal agreement specifically addressing property rights of collected materials, these ex-situ collections become the legal property of the centre, consortia or the country in which the collection or database is stored,<sup>423</sup> and the 'owners' are free to develop the materials in whatever way they wish, subject to applicable domestic legislation and policy. Antarctic samples removed from the region and now stored in national collections are under national jurisdiction and free availability can not be guaranteed nor enforced.

While a moratorium may not be practical at this stage, however, a ban placed over the patenting of any product or process derived from the Antarctic would stop derivation of any economic benefit from bioprospecting. This would limit, at least for the time being, any upstream product development and any need to source Antarctic materials. It would, however, be difficult, or even impossible, to enforce as it would require reliance on national patenting offices to stop any Antarctic-related application. It may also conflict with state's obligations under the TRIPS agreement, which all Antarctic Treaty Consultative states have ratified.

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<sup>422</sup> Davor Vidas, *Implementing the Environmental Protocol Regime for the Antarctic*, (2000) 4.

<sup>423</sup> See Sarah Whatmore, *Hybrid Geographies: natures, cultures, spaces*, (2002) 107.

Any moratorium appears unlikely, and perhaps even unnecessary, at this stage, given the perceived low level of activity in the Antarctic and the general feeling that currently the activity is causing little environmental impact. As an alternative to asking whether there should be a moratorium on bioprospecting, the question that may require consideration is ‘What losses [commercial, medical, industrial or otherwise] would we incur if we did not conduct bioprospecting in the Antarctic?’<sup>424</sup>

Currently, all bioprospecting in the Antarctic is carried out within, and therefore with the approval of, national Antarctic research programmes. Consultative states may decide that as long as the activity poses little to no environmental problems then the activity may proceed as is, that is, within the context of their research programs and without formal, specific, regulation. The nexus, however, between scientific research within national Antarctic research programmes and the potential for the research to lead to a commercial benefit for the state (or states) involved, may prove to be a conflict of interest that prevents Antarctic Treaty Consultative states from acting truly in good faith in their discussions of Antarctic bioprospecting. The likelihood of now enacting or enforcing a moratorium appears very low due to this close connection.

### *E Interim Measure*

A less drastic approach may be to negotiate and approve an interim measure. A measure is the highest level of legal agreement by the Antarctic Treaty System which is allowed for under provisions of the Antarctic Treaty.<sup>425</sup> A measure is an example of a ‘soft law’ tool and such tools have inherent advantages. First, such approaches, according to Joyner, ‘indicate where the law might be heading’.<sup>426</sup> Second, they are legally binding once approved by all consultative states. Finally, development of the interim measure allows for formal discussion and debate of the issue.

Any major agreement for bioprospecting will require a degree of scientific certainty to be effective. This certainty is currently lacking, as evidenced, for example, by the lack of consensus on a definition of bioprospecting, and by the need for the proposed

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<sup>424</sup> See Supply Workgroup Report, Bioprospecting in Antarctica Workshop, Christchurch, April 2003.

<sup>425</sup> See Decision 1(1995) Measures, Decisions and Resolution for a definition of Measure; See also Part I of this thesis.

<sup>426</sup> Joyner, above n 92.

review of its current level. An interim measure, therefore, might be appropriate at this stage. The measure might be as simple restating the Antarctic Treaty Article III obligation or it might go further and elaborate on the precise meaning of the article in the context of commercial activity in the Antarctic. It should also include a reaffirmation of the Article II and IV provisions of the treaty.

Birnie and Boyle note that ‘accommodations expressed through the adoption of soft law also serve as a focus for the emergence of a more widespread and consistent body of practice.’<sup>427</sup> Any major legal instrument takes time to negotiate and to reach consensus, the Protocol’s annex on liability is only one such example within the Antarctic Treaty System. So that, an interim measure makes good sense at this point in time with this in mind.

CCAMLR and CRAMRA were negotiated under urgency in a rush to ‘flesh out’ the Antarctic Treaty System and prove its viability by 1991<sup>428</sup> - the deadline for the Antarctic Treaty 30 year review. This urgency, most likely, assisted in the successful negotiation of these two legal instruments. The demise of CRAMRA, without a replacement, would have inevitably meant ‘formal review’ of Antarctic Treaty System on the whole, which could well have resulted in its downfall and substitution by another system. As no such deadline currently looms for a bioprospecting decision, any negotiations towards a comprehensive legal instrument might take years, or even decades, to put into place, especially given that there may be reluctance to target an activity that is taking place within the National Antarctic programmes themselves. The usefulness an interim measure at this stage is, therefore, evident.

#### *F CCAMLR and CRAMRA: Lessons learned*

If bioprospecting continues to be carried out in the Antarctic, there will soon come a time when a comprehensive bioprospecting convention will be required. This convention will undoubtedly contain innovative provisions dealing with issues specific to bioprospecting. It is also possible, however, to rely on provisions and approaches from other Antarctic resources related conventions, namely CCAMLR

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<sup>427</sup> Birnie and Boyle, above n 237, 17.

<sup>428</sup> Deborah Shapley, *The seventh continent: Antarctica in a resource age* (1985), 239.

and CRAMRA, to provide direction. While this thesis argues that neither CCAMLR nor CRAMRA as they currently stand are adequate to cover the legal implications of bioprospecting, each may be considered to contain useful provisions which might be important to incorporate into any bioprospecting convention. These are presented below.

For CCAMLR, Burke notes that its two vital concepts are ‘the precautionary principle and the ecosystem approach.’<sup>429</sup> The precautionary principle is ‘where decisions should be taken that have a low risk of long-term adverse affects.’<sup>430</sup> This approach is often referred to in the context of Antarctic environmental matters and it is generally of importance when there is scarcity of, or uncertainty associated with, scientific data related to a proposed activity. This is the current situation with information and data associated with Antarctic biodiversity, and, therefore, the precautionary approach as advocated by CCAMLR would appear to be appropriate in a bioprospecting convention.

An ecosystem approach is an ambitious one which requires a commitment to protection of the environment and its associated species. The ecosystem approach is complex, involving many factors and mandating that consideration must be given to the relationship of species and between species. It also requires that consideration be given to the impact on the ecosystem resulting from the removal of any organism, for any reason. The ecosystem approach was an innovative one when CCAMLR was negotiated. Today, it has come to be common place in environmental regulations. It should, therefore, be part of any bioprospecting regulation but may be impossible to achieve in practice.

With CRAMRA, the Antarctic Treaty System seemed to produce ‘the blueprint of a closed access model for economic activity’<sup>431</sup> in the region which might now be used as a model for the regulation of Antarctic bioprospecting. Bush noted that:

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<sup>429</sup> Burke, above n 107, 137.

<sup>430</sup> Ibid.

<sup>431</sup> See van der Lugt, above n 8.

‘Commercial interest in prospecting for unknown biochemicals of possible medical or other use is a relatively low impact activity that can be carried out in the context of existing scientific programs. Without doubt the regulatory starting point for this activity will be the open access regime for scientific research spelt out in the Antarctic Treaty.’<sup>432</sup>

While this has proved to be the case to date, any increase in the level of the activity may force the parties to prepare a closed access regime specifically addressing the utilization of living resources. This would, however, go against any argument for a global commons or CHM arrangement. Antarctic mineral activities were prohibited unless permitted and conducted in accordance with CRAMRA. The same should be true for any bioprospecting in the Antarctic. This too, may be difficult to enforce in practice as any third party states are under no obligation to comply with a legal instrument that they have not signed.

CRAMRA stated in its Article 2, that it is an integral component of the Antarctic Treaty System, reiterating and incorporating the Article IV Antarctic Treaty provision on sovereignty. Like the minerals negotiations, any discussions on living resources of Antarctica will certainly include consideration of the contentious sovereignty issue. Importantly, CRAMRA addressed access to and benefits from Antarctic resources and also provided a solution for dealing with confidential data. If CRAMRA had been ratified as planned, it would have allowed mineral exploitation ‘without the explicit assignment of national property rights and sovereignty to Antarctic territory-this would be “something new” in the development of an entire continent’<sup>433</sup> and certainly requires consideration in the context of bioprospecting. CRAMRA included rules regarding inspection, monitoring, penalties and sanctions which also require consideration in the context of any bioprospecting regulation.

It is important to note that the political framework in which CCAMLR and CRAMRA were negotiated has changed and fundamental global changes in politics and policies have changed since the signing of the Antarctic Treaty. This sets a scene where any discussions of Antarctic bioprospecting might take place different from the stage set during negotiations of the Antarctic Treaty. Any lessons learned from past

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<sup>432</sup> Bush, above n 247, 140.

<sup>433</sup> Bernard Herber ‘The common heritage principle: Antarctica and the developing nations’ (1991) 50.4 *American Journal of Economics and Sociology* 391, 398.

negotiations will now have to be reinterpreted to reflect different political and societal thinking from 2005 and beyond.

### *G The Protocol's Approach*

The strict environmental protection mechanisms first laid down in CRAMRA and now contained within the Protocol, should be the approach taken with any bioprospecting instrument. The Protocol regulates environmental impact from all human activity in the Antarctic. It proclaims Antarctica a natural reserve, recognises the intrinsic value of the region, and gives scientific activity priority over all other activities. While the Protocol is to be applauded for its success to date and while it may provide adequate protection against adverse environmental impact from bioprospecting, it is arguable whether it should be the primary or sole legal instrument used to regulate it, especially given that it lacks access and benefit-sharing provisions. It lacks the ability to address issues regarding resource exploitation, a topic which it was never intended to address. The proclamation of the region as a natural reserve, the prioritization of scientific activity and the recognition of the intrinsic value of Antarctica could be incorporated into any specific bioprospecting regulation, or bioprospecting, like any other Antarctic activities would be subject to regulation under a specific convention on bioprospecting and subject to the strict environmental protection provisions of the Protocol. The Protocol could, on the contrary, be cited in support of a moratorium to be imposed on bioprospecting in the Antarctic. It is not an adequate instrument, in itself, to regulate commercial activities such as natural resource exploitation. Currently, discussions about Antarctic tourism recognise that while the provisions of the Protocol must be adhered to, they are not sufficient to regulate tourism itself. A separate accreditation scheme for non-government activities (tourism) has been proposed within the Antarctic Treaty System and any such scheme may be an example of how all non-governmental activities in the region could be regarded and regulated. This proposal may have implications for bioprospecting also.

Bioprospecting whether carried out in the context of National Antarctic Programmes or within privately funded and supported expeditions, currently has to follow the necessary steps for approval, as provided in the Protocol, and also within the national guidelines of Antarctic Treaty state parties. There has also been discussion as to

whether environmental protection is a customary rule of international law. This final point is briefly considered below as it has implications for the regulation of bioprospecting.

### *I Environmental protection as a rule of customary international law*

Treaties do not, ipso facto, bind third party states, unless the intention to do so is clearly expressed and the state concerned expressly accepts the benefits or obligations that arise. This acceptance is, however, relatively unusual. Academics debate, however, if international law now imposes a general obligation of conservation and sustainable use of natural resources and the natural environment, as there now exists a wide body of global and regional treaties concerned with conservation and environmental protection.<sup>434</sup> If so, this would mean that those states which have ratified the Protocol, and all other states regardless of their involvement in the ATS, would be obliged to protect the Antarctic environment.

Whether the Protocol may simply have codified emerging customary state practice has not been formally discussed. The actual practice and opinion juris of those states not party to the Antarctic Treaty and/or the Protocol may reflect the belief that environmental protection is a customary norm for the Antarctic region. The obligation to protect the Antarctic regions unique biodiversity, whether from bioprospecting or any other act or activity, may be a legal obligation erga omnes. This would imply that if an Antarctic bioprospecting convention were negotiated, even those states that did not sign the convention and did not sign the Protocol might still be required to operate in the Antarctic region within the strict environmental protection guidelines that are laid down within the Protocol or which could be prescribed within any bioprospecting convention.

### *H Antarctic Bioprospecting Convention*

If bioprospecting is an activity with a peaceful purpose, that supports scientific investigation and cooperation in the Antarctic, and is an activity that, when carried out properly, does little damage to the Antarctic environment, then it should be allowed to

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<sup>434</sup> Birnie and Boyle, above n 237, 88-89.



continue in the Antarctic. The question then becomes how do we manage and regulate this activity within the Antarctic Treaty System? It can be argued, that because of the issues regarding resource use and sovereignty and because of the activities potentially to benefit all mankind, bioprospecting requires a legal instrument devoted exclusively to it. Exactly what format such an instrument would take requires further debate and discussion, however, a first draft of the key provisions is presented below.

Any attempt at negotiating a convention must adequately address the legal implications, summarized above, within the framework of the ATS, recognising the internal conflicts amongst Antarctic Treaty Consultative state parties and external conflicts as discussed throughout this thesis. Suggested approaches to such a convention would include the precautionary approach to living resource use, the establishment of robust access and benefit-sharing provisions, administrative provisions for database creation, development and management, and ultimately the establishment of a scientific committee with responsibility for sustainable management of any use of Antarctic biota.

Any stand alone legal instrument would also require Antarctic Treaty parties to consider overlapping international conventions and regimes, such as UNCLOS, the CBD, and TRIPS.

Of fundamental importance is the Antarctic Treaty's Article III obligation for free availability of scientific information and results, and the Article IV obligation to compromise on sovereignty. Both of these articles should be reiterated in a bioprospecting convention. Ignoring the sovereignty situation could result in an escalation of internal conflicts amongst the Treaty parties which might, in the end, bring down the Antarctic Treaty System. Such a result would inevitably invite involvement of the international community. The form of any new convention must consider the emerging view of the international community, including consideration of common heritage of mankind arguments and the regulation of the Antarctic region, or at least the biota of that region, as part of the global commons. Failure to adequately address these issues could re-ignite debate about United Nations involvement in the Antarctic or could see other non-state actors, such as commercial companies, with a greater role.

With these points in mind, the following key provisions are presented for inclusion in an Antarctic Bioprospecting Convention.

*I Key provisions of an Antarctic Bioprospecting Convention*

Like most of the opening text of major treaties, the preamble of the Antarctic bioprospecting convention would lay down broad principles and grand ideas. The suggested text would most likely resemble the following:

***Preamble (draft)***

*The Representatives,*

*Noting* that bioprospecting is occurring in the Antarctic region;

*Convinced* of the benefits of bioprospecting;

*Recalling* the obligations under the Antarctic Treaty, CCAMLR, the Protocol and the other component parts of the Antarctic Treaty System;

*Recognizing* the values of the region, including its intrinsic and scientific values;

*Note* that Antarctica shall forever be used for peaceful purposes only and shall not become the scene of international discord.

More importantly the key provisions of any convention must begin with the object of the convention and must contain a clear definition section. These key provisions are presented as articles I and II, respectively.

***Article I (draft)***

The objective of this convention is to regulate all phases of bioprospecting in relation to Antarctic biota.

While it is recognised that only the initial phases of bioprospecting may be carried out in the Antarctic region, importantly the objective of the convention must state that the Antarctic Treaty parties wish to be involved in all phases of the process, from search

and discovery, through to commercialisation of a product or process. So that while they clearly will regulate the phases of the activity that may take place in the Antarctic, Antarctic Treaty parties must maintain some level of involvement in the entire process, in order to have a stake in benefit-sharing.

A definition of bioprospecting must be full and finally agreed to and must be included in the bioprospecting convention. It will also be important to include the legal definition of other terms, such as what is specifically meant, inter alia, by 'biota', 'living resources' and 'biodiversity'. For these terms, the Antarctic Treaty System could rely on existing international legal instruments, such as the CBD, which contain relevant and useful definitions that have already been agreed to by a majority of states also involved in the Antarctic Treaty System. Here, a suggested definition of bioprospecting, as presented and defended in Part I of this thesis is utilized for the draft of article II of the Antarctic bioprospecting convention.

***Article II (draft)***

For the purposes of the Antarctic Treaty System,

***Bioprospecting*** means 'The search for valuable chemical compounds and genetic materials from plants, animals and micro-organisms; the extraction and testing of those compounds and materials for biological activity; and the research and commercial development of those that show activity'.

Any Antarctic bioprospecting convention, which will be an integral component of the Antarctic Treaty System, should, like CRAMRA and CCAMLR, restate the Article III and Article IV provisions of the Antarctic Treaty. While each of these previous conventions restated those provisions with a slight variant, specific to their objectives and goals, clearly the purpose was to reaffirm the importance of the agreement by the parties to compromise on sovereignty and to promote cooperation. These are important in any convention involving the utilization of Antarctic resources.

In the case of bioprospecting, any restatement of Article III of the Antarctic Treaty should be accompanied by a clear explanation of the extent of that obligation, especially in the context of patenting. So that, for the bioprospecting convention, the reiteration of the Antarctic Treaty Article III obligation might be followed by:

*Article (draft)*

Protection of Intellectual Property Rights, including in particular patents in relation to an Antarctic-related product or process, will not necessarily breach the Article III obligation as stated in the Antarctic Treaty, and reaffirmed here, provided that:

1. The researcher or discoverer had declared that he/she was participating in a bioprospecting-related research activity when the application for access was submitted, and this declaration was confirmed by the National Antarctic Programme and formally submitted (at an ATCM) under the exchange of information obligation under the Antarctic Treaty.
2. The researcher or discoverer has declared the source of any funding they received in support of any phase of their bioprospecting activities.
3. The original discovery of the Antarctic organism was fully described and registered within the Antarctic biodiversity database.
4. If a patent application is approved and a patent granted, the patent holder shall make the Antarctic Treaty System aware, through the relevant National Antarctic Programme of the patent number.

A clear provision on access to and benefit from Antarctic bioprospecting must be included in the convention. CRAMRA relied on sponsoring state provisions for access to Antarctic mineral resources. While it may be that this type of provision and sponsorship becomes necessary for bioprospecting, the fact that the activity relies on the harvesting of relatively minor amounts of biodiversity may mean that the ‘search’ and ‘discovery’ phase may be implemented simply through access to an Antarctic biodiversity database. That is, access may be provided by way of the database, not by providing access for every bioprospector, to the Antarctic region itself. Populating the database with biodiversity would be the responsibility of National Antarctic programmes, but the database would be the combination of efforts by the National Antarctic programmes as a whole. That is, the database would contain biodiversity data and information from all consultative state parties conducting biodiversity research in the Antarctic region. Samples from the database would be distributed once the bioprospecting researcher or team has completed the necessary contract, paid a

licensing fee and fulfilled their obligations under the exchange of information article of the convention (stated in the draft article immediately above). Any property rights assigned would include joint ownership, so that the Antarctic Treaty states retain ownership and are therefore stakeholders in any research and development.

While this may sound like a radical idea, it provides a mechanism to protect the Antarctic environment, it creates a resource (the database) that can be utilised by states that may not have the capacity to send research teams to Antarctica, it allows for control over Antarctic biodiversity and such control would provide the awareness necessary to assist in benefit-sharing.

*Article (draft)*

All information on Antarctic biodiversity shall be maintained, by the Antarctic Treaty System, by way of the Antarctic biodiversity database. The database is the property and responsibility of the Antarctic Treaty Consultative parties and the information in the database shall be freely available.

Any use of the information requires:

1. The user to register with the Antarctic Treaty Secretariat;
2. The user to pay an access fee (such fee to go to the maintenance and upkeep of the database);
3. The user to enter into an agreement with the Antarctic Treaty System for the distribution of any benefit-derived from the use of the Antarctic biodiversity database.

This provision and the idea of the database provides an opportunity for the Antarctic Treaty System, which fulfils many of its obligations and may ultimately be the vehicle required to provide access to Antarctic resources for the benefit of all mankind. This is the most important consideration for the Antarctic Treaty System in the development of any regime regarding Antarctic bioprospecting.

Like most major legal instruments, the bioprospecting convention would include important administrative provisions, especially concerning membership, amendment, and duration. Like the Antarctic Treaty, the bioprospecting convention would be open for signature by any member state of the United Nations. It would, however, be

impractical (and also probably highly unlikely) that any such state should be outside of the Antarctic Treaty System. So that there should be provision in the bioprospecting convention that it is open for signature by any signatory state of the Antarctic Treaty, and the Protocol, and would be subject to amendment by unanimous agreement of the Antarctic Treaty Consultative state parties only. Given the fast pace of technology, the convention would require review after a relatively short period of time, perhaps 20 years and should also be given an expiration date. For example, the convention would expire in 50 years, or sooner by unanimous agreement.

Given that bioprospecting is already underway in the Antarctic region, it is important for the treaty system to give consideration to the regulation of the activity which could, if addressed properly, provide the system with an opportunity to increase its credibility in the eyes of the international community.

### *I Conclusions*

The Antarctic Treaty System has proved to be malleable in the past, and regulating bioprospecting may be yet another opportunity for that system to prove its robustness.

There has been little formal debate on bioprospecting in the Antarctic Treaty System. Issues regarding commercialization and the use of Antarctic living resources must be addressed. Currently, there appears to be less than a minor or transitory environmental impact from Antarctic bioprospecting, so that bodies such as the CEP have only touched on what they perceive to be a legal and political issue, and not an environmental one. The issues central to the discussions, those involving significant legal and policy questions have not been adequately discussed and are likely to become troublesome as the bioprospecting industry develops, especially if, or when, a significant find is announced, and the economic stakes become real and high! There may not currently be the trained legal experts available within the Antarctic Treaty arena, to dedicate their time and energy to consideration of bioprospecting. It is essential that the ATS begins the process of engaging a group of legal experts to consider the issues. Failure to do so soon might led to the perception that the Antarctic Treaty states are deliberately ignoring the issue due to their vested interests.

While there are similarities between the mineral resources debate and those involving utilization of living resources, so that lessons learned during the negotiation of CCAMLR and CRAMRA can be helpful, the issues are not identical. Not only has the arena changed, but commercialisation of living resources involve ethical considerations much greater than those involved in mineral exploitation and those currently found in fisheries.

Investigation throughout this thesis points to two critical issues that must be addressed: the Article III obligation for free availability of observations and results and the property rights issues surrounding the Antarctic sovereignty situation. While balancing sovereignty considerations has worked in the past, issues involving commercial activities and the utilization of Antarctic resources reignite the sovereignty debate. Bioprospecting in the Antarctic involves serious commercial interests, with a commercial potential worth far more than mineral exploitation. It is, however, a more stable political environment than the late 1950s, so that discussions of sovereignty might not necessarily invoke 'fear of chaos'. This may allow for consideration of unique options in the regulation of Antarctic bioprospecting including those which could truly be for the benefit of all humankind. In any resource related discussion, it is clear, that the underlying sovereignty issue starts to thaw and demands reconsideration.

Clarification is needed on the strict legality of patenting of an Antarctic-derived product or process. While there is nothing contained in domestic patent law specifically regarding Antarctic material and while patenting criteria requires full disclosure, patenting may be a breach of the obligation to make scientific observations and results freely available. The requirements of the TRIPS agreement, however, may not allow for the withholding of a patent simply because the biological material utilised in the invention was initially from the Antarctic region. Further investigation of the impact of TRIPS and other international obligations is required.

Simply doing nothing about bioprospecting is not a wise option. Leaving a 'gap' in any regulation regarding an activity that is already being undertaken in the Antarctic, risks heightened involvement from the international community, in much the same way that leaving a gap in any mineral exploitation regime would have inevitably

involved outside involvement from the international community. While doing nothing is indeed an option, issues regarding the utilization of Antarctic resources will arguably become more frequent in the future as technology opens up a range of possibilities and humanity is faced with urgent resource requirements. So that any discussions undertaken now or solutions created regarding bioprospecting, may lead to a model for regulation that can be applied in the context of other resources. CRAMRA is often referred to as ‘useful’ specifically for this reason. With little national policy on bioprospecting at a state level, this may also be an opportunity for the Antarctic Treaty System to prepare an arrangement that can provide insight for those countries that have yet to develop policy.

Some people may ask ‘Why worry?’ If impacts and levels of bioprospecting in the Antarctic region are currently so low why not simply ignore it? One reason becomes obvious when considering the scale of bioprospecting in the United States. In 2002, there were nearly 2,000 biotech companies operating there, and at least one new biotech company commences operations every single day.<sup>435</sup> This incredible expansion of the industry will inevitably lead to heightened interests in biota from other environments. Antarctica and the Southern Ocean will increasingly become targets. Without a moratorium, inadequate or non-existing regulation, will lead to exploitation and inequitable benefit-sharing. It may also impact on the region’s intrinsic values and those values it holds for scientific investigation and co-operation.

Roald Amundsen, when he went ashore in Antarctica said ‘the land looks like a fairy tale’, while Robert Falcon Scott proclaimed it ‘an awful place’. The difference appears to be one of vantage point. Most of the world would probably consider that Antarctica remains a land that looks like a fairy tale. If we allow resource extraction activities such as bioprospecting to turn it into ‘an awful place’ it will be to our great detriment. Therefore, the Antarctic Treaty parties and those with an interest in bioprospecting in the region should focus on developing regulation that will protect the region, and its living resources, truly for the benefit of all.

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<sup>435</sup> Rahuk Dharda, *Guiding Icarus: Merging bioethics with corporate interests* (2002) xiii.



## **APPENDIX 1: The Antarctic Treaty 1959**

The Governments of Argentina, Australia, Belgium, Chile, the French Republic, Japan, New Zealand, Norway, the Union of South Africa, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America,

Recognizing that it is in the interest of all mankind that Antarctica shall continue for ever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord;

Acknowledging the substantial contributions to scientific knowledge resulting from international cooperation in scientific investigation in Antarctica;

Convinced that the establishment of a firm foundation for the continuation and development of such cooperation on the basis of freedom of scientific investigation in Antarctica as applied during the International Geophysical Year accords with the interests of science and the progress of all mankind;

Convinced also that a treaty ensuring the use of Antarctica for peaceful purposes only and the continuance of international harmony in Antarctica will further the purposes and principles embodied in the Charter of the United Nations;

Have agreed as follows:

### **Article I**

1. Antarctica shall be used for peaceful purposes only. There shall be prohibited, inter alia, any measure of a military nature, such as the establishment of military bases and fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapon.

2. The present Treaty shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose.

### **Article II**

Freedom of scientific investigation in Antarctica and cooperation toward that end, as applied during the International Geophysical Year, shall continue, subject to the provisions of the present Treaty.

### **Article III**

1. In order to promote international cooperation in scientific investigation in Antarctica, as provided for in Article II of the present Treaty, the Contracting Parties agree that, to the greatest extent feasible and

practicable:

- a. information regarding plans for scientific programs in Antarctica shall be exchanged to permit maximum economy of and efficiency of operations;
- b. scientific personnel shall be exchanged in Antarctica between expeditions and stations;
- c. scientific observations and results from Antarctica shall be exchanged and made freely available.

#### **Article IV**

Nothing contained in the present Treaty shall be interpreted as:

1. a renunciation by any Contracting Party of previously asserted rights of or claims to territorial sovereignty in Antarctica;
2. a renunciation or diminution by any Contracting Party of any basis of claim to territorial sovereignty in Antarctica which it may have whether as a result of its activities or those of its nationals in Antarctica, or otherwise;
3. prejudicing the position of any Contracting Party as regards its recognition or non-recognition of any other State's rights of or claim or basis of claim to territorial sovereignty in Antarctica.

No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

#### **Article V**

1. Any nuclear explosions in Antarctica and the disposal there of radioactive waste material shall be prohibited. 2. In the event of the conclusion of international agreements concerning the use of nuclear energy, including nuclear explosions and the disposal of radioactive waste material, to which all of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX are parties, the rules established under such agreements shall apply in Antarctica.

#### **Article VI**

The provisions of the present Treaty shall apply to the area south of 60deg. South Latitude, including all ice shelves, but nothing in the present Treaty shall prejudice or in any way affect the rights, or the exercise of the rights, of any State under international law with regard to the high seas within that area.

#### **Article VII**

1. In order to promote the objectives and ensure the observance of the provisions of the present Treaty, each Contracting Party whose representatives are entitled to participate in the meetings referred to in Article IX of the Treaty shall have the right to designate observers to carry out any inspection provided for by the present Article.

Observers shall be nationals of the Contracting Parties which designate them. The names of observers shall be communicated to every other Contracting Party having the right to designate observers, and like notice shall be given of the termination of their appointment.

2. Each observer designated in accordance with the provisions of paragraph 1 of this Article shall have complete freedom of access at any time to any or all areas of Antarctica.

3. All areas of Antarctica, including all stations, installations and equipment within those areas, and all ships and aircraft at points of discharging or embarking cargoes or personnel in Antarctica, shall be open at all times to inspection by any observers designated in accordance with paragraph 1 of this Article.

4. Aerial observation may be carried out at any time over any or all areas of Antarctica by any of the Contracting Parties having the right to designate observers.

5. Each Contracting Party shall, at the time when the present Treaty enters into force for it, inform the other Contracting Parties, and thereafter shall give them notice in advance, of

1. all expeditions to and within Antarctica, on the part of its ships or nationals, and all expeditions to Antarctica organized in or proceeding from its territory;

2. all stations in Antarctica occupied by its nationals; and

3. any military personnel or equipment intended to be introduced by it into Antarctica subject to the conditions prescribed in paragraph 2 of Article I of the present Treaty.

#### **Article VIII**

1. In order to facilitate the exercise of their functions under the present Treaty, and without prejudice to the respective positions of the Contracting Parties relating to jurisdiction over all other persons in Antarctica, observers designated under paragraph 1 of Article VII and scientific personnel exchanged under sub-paragraph 1(b) of Article III of the Treaty, and members of the staffs accompanying any such persons, shall be subject only to the jurisdiction of the Contracting Party of which they are nationals in respect of all acts or omissions occurring while they are in Antarctica for the purpose of exercising their functions.

2. Without prejudice to the provisions of paragraph 1 of this Article, and pending the adoption of measures in pursuance of subparagraph 1(e) of Article IX, the Contracting Parties concerned in any case of dispute with regard to the exercise of jurisdiction in Antarctica shall immediately consult together with a view to reaching a mutually acceptable solution.

#### **Article IX**

1. Representatives of the Contracting Parties named in the preamble to the present Treaty shall meet at the City of Canberra within two months after the date of entry into force of the Treaty, and thereafter at suitable intervals and places, for the purpose of exchanging information, consulting together on matters of common interest pertaining to Antarctica, and formulating and considering, and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty, including measures regarding:

use of Antarctica for peaceful purposes only;

facilitation of scientific research in Antarctica;

facilitation of international scientific cooperation in Antarctica;

facilitation of the exercise of the rights of inspection provided for in Article VII of the Treaty;  
questions relating to the exercise of jurisdiction in Antarctica;  
preservation and conservation of living resources in Antarctica.

2. Each Contracting Party which has become a party to the present Treaty by accession under Article XIII shall be entitled to appoint representatives to participate in the meetings referred to in paragraph 1 of the present Article, during such times as that Contracting Party demonstrates its interest in Antarctica by conducting substantial research activity there, such as the establishment of a scientific station or the despatch of a scientific expedition.
3. Reports from the observers referred to in Article VII of the present Treaty shall be transmitted to the representatives of the Contracting Parties participating in the meetings referred to in paragraph 1 of the present Article.
4. The measures referred to in paragraph 1 of this Article shall become effective when approved by all the Contracting Parties whose representatives were entitled to participate in the meetings held to consider those measures.
5. Any or all of the rights established in the present Treaty may be exercised as from the date of entry into force of the Treaty whether or not any measures facilitating the exercise of such rights have been proposed, considered or approved as provided in this Article.

#### **Article X**

Each of the Contracting Parties undertakes to exert appropriate efforts, consistent with the Charter of the United Nations, to the end that no one engages in any activity in Antarctica contrary to the principles or purposes of the present Treaty.

#### **Article XI**

1. If any dispute arises between two or more of the Contracting Parties concerning the interpretation or application of the present Treaty, those Contracting Parties shall consult among themselves with a view to having the dispute resolved by negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement or other peaceful means of their own choice.
2. Any dispute of this character not so resolved shall, with the consent, in each case, of all parties to the dispute, be referred to the International Court of Justice for settlement; but failure to reach agreement on reference to the International Court shall not absolve parties to the dispute from the responsibility of continuing to seek to resolve it by any of the various peaceful means referred to in paragraph 1 of this Article.

#### **Article XII**

1. The present Treaty may be modified or amended at any time by unanimous agreement of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX. Any such modification or amendment shall enter into force when the depositary Government has received notice from all such Contracting Parties that they have ratified it.
2. Such modification or amendment shall thereafter enter into force as to any other Contracting Party when notice of ratification by it has been received by the depositary Government. Any such Contracting Party from which no notice of ratification is received within a period of two years from the date of entry into force of the

modification or amendment in accordance with the provision of subparagraph 1(a) of this Article shall be deemed to have withdrawn from the present Treaty on the date of the expiration of such period.

3. If after the expiration of thirty years from the date of entry into force of the present Treaty, any of the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX so requests by a communication addressed to the depositary Government, a Conference of all the Contracting Parties shall be held as soon as practicable to review the operation of the Treaty.

4. Any modification or amendment to the present Treaty which is approved at such a Conference by a majority of the Contracting Parties there represented, including a majority of those whose representatives are entitled to participate in the meetings provided for under Article IX, shall be communicated by the depositary Government to all Contracting Parties immediately after the termination of the Conference and shall enter into force in accordance with the provisions of paragraph 1 of the present Article

5. If any such modification or amendment has not entered into force in accordance with the provisions of subparagraph 1(a) of this Article within a period of two years after the date of its communication to all the Contracting Parties, any Contracting Party may at any time after the expiration of that period give notice to the depositary Government of its withdrawal from the present Treaty; and such withdrawal shall take effect two years after the receipt of the notice by the depositary Government.

### **Article XIII**

1. The present Treaty shall be subject to ratification by the signatory States. It shall be open for accession by any State which is a Member of the United Nations, or by any other State which may be invited to accede to the Treaty with the consent of all the Contracting Parties whose representatives are entitled to participate in the meetings provided for under Article IX of the Treaty.

2. Ratification of or accession to the present Treaty shall be effected by each State in accordance with its constitutional processes.

3. Instruments of ratification and instruments of accession shall be deposited with the Government of the United States of America, hereby designated as the depositary Government.

4. The depositary Government shall inform all signatory and acceding States of the date of each deposit of an instrument of ratification or accession, and the date of entry into force of the Treaty and of any modification or amendment thereto.

5. Upon the deposit of instruments of ratification by all the signatory States, the present Treaty shall enter into force for those States and for States which have deposited instruments of accession. Thereafter the Treaty shall enter into force for any acceding State upon the deposit of its instruments of accession.

6. The present Treaty shall be registered by the depositary Government pursuant to Article 102 of the Charter of the United Nations.

### **Article XIV**

The present Treaty, done in the English, French, Russian and Spanish languages, each version being equally authentic, shall be deposited in the archives of the Government of the United States of America, which shall transmit duly certified copies thereof to the Governments of the signatory and acceding States.

**APPENDIX 2: PARTIES TO THE ANTARCTIC TREATY SYSTEM'S COMPONENT INSTRUMENTS (December 2004)**

PARTY	ATS INSTRUMENT			
	Antarctic Treaty	CCAS	CCAMLR	Env. Protocol
1. Argentina	✓	✓	✓	✓
2. Australia	✓	✓	✓	✓
3. Austria	C	-	-	C
4. Belgium	✓	✓	✓	✓
5. Brazil	✓	✓	✓	✓
6. Bulgaria	✓	-	C	✓
7. Canada	C	✓	C	✓
8. Chile	✓	✓	✓	✓
9. China	✓	-	-	✓
10. Colombia	C	-	-	C
11. Cuba	C	-	-	-
12. Czech Republic	C	-	-	✓
13. Denmark	C	-	-	C
14. Ecuador	✓	-	-	✓
15. Estonia	C	-	-	-
16. European Community -	-	-	✓	-
17. Finland	✓	-	C	✓
18. France	✓	✓	✓	✓
19. Germany	✓	✓	✓	✓
20. Greece	C	-	C	✓
21. Guatemala	C	-	-	-
22. Hungary	C	-	-	C
23. India	✓	-	✓	✓
24. Italy	✓	✓	✓	✓
25. Japan	✓	✓	✓	✓
26. Korea, Republic	✓	-	✓	✓
27. Korea, DPR	C	-	-	C
28. Namibia	-	-	✓	-
29. Netherlands	✓	-	C	✓
30. New Zealand	✓	C	✓	✓
31. Norway	✓	✓	✓	✓
32. Papua New Guinea	C	-	-	-
33. Peru	✓	-	C	✓
34. Poland	✓	✓	✓	✓

35. Romania	C	-	-	✓
36. Russian Federation	✓	✓	✓	✓
37. Slovak Republic	C	-	-	C
38. South Africa	✓	✓	✓	✓
39. Spain	✓	-	✓	✓
40. Sweden	✓	-	✓	✓
41. Switzerland	C	-	-	C
42. Turkey	C	-	-	-
43. Ukraine	✓	-	✓	✓
44. United Kingdom	✓	✓	✓	✓
45. United States	✓	✓	✓	✓
46. Uruguay	✓	-	✓	✓
47. Vanuatu	-	-	C	-
48. Venezuela	C	-	-	-

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Key:

- ✓ 'First-level' Party which has Ratified, Accepted or Approved that instrument. For the Antarctic Treaty such a Party is termed a "Consultative Party", and for CCAMLR a "Member of the Commission"
- C 'Second-level' Contracting Party to that instrument
- Not a Party to that instrument
- 

Chart created and data compiled by Alan D. Hemmings, originally for the Proceedings of the Bioprospecting in Antarctica Workshop: Antarctic Bioprospecting, 2005 (In press). Used with permission.

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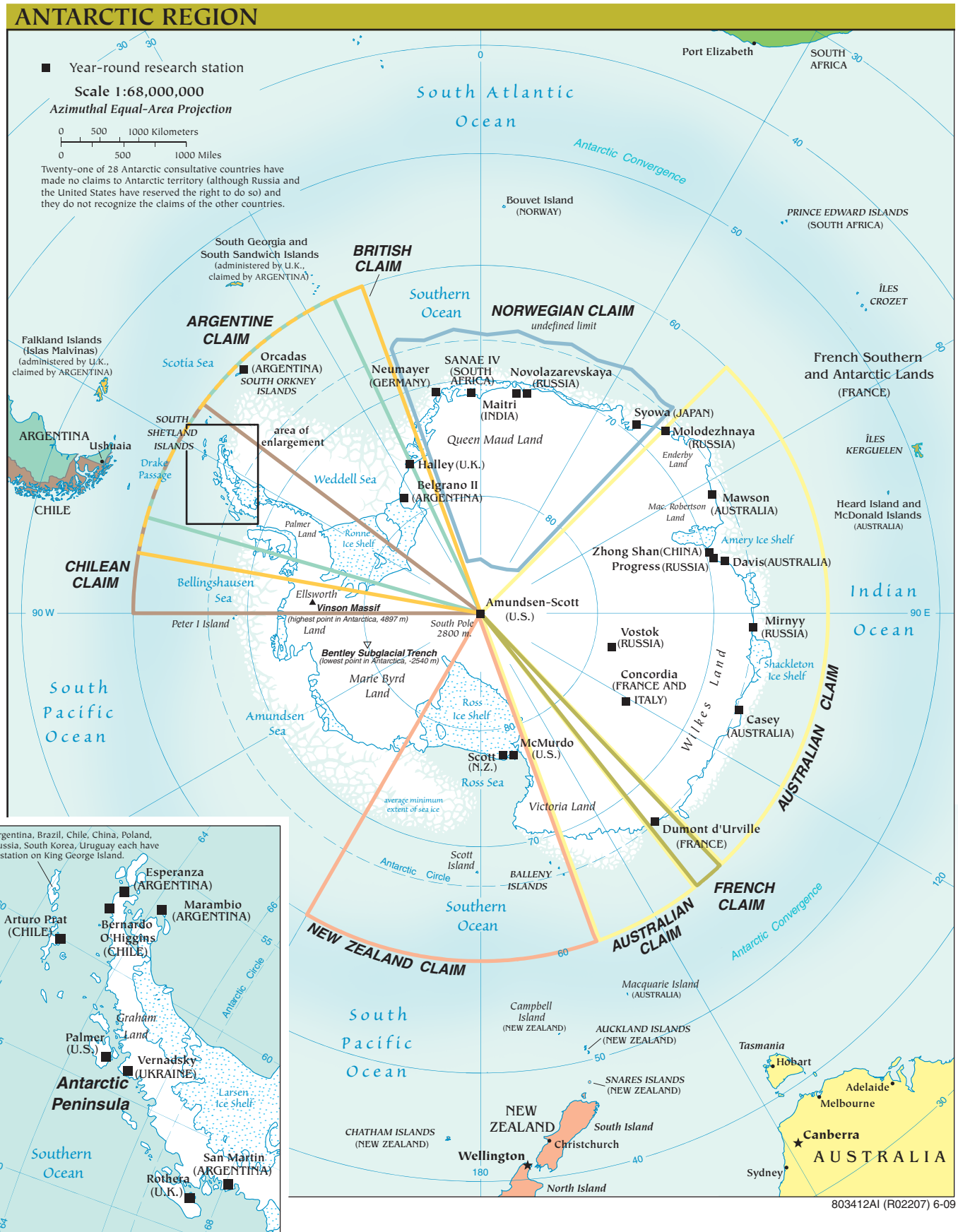
*Convention for the Conservation of Antarctic Seals:*

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*Convention on the Conservation of Antarctic Marine Living Resources:*

Australia. 2004. 'Report by the head of the Australian delegation in his capacity as representative of the Depository Government for the Convention on the Conservation of Antarctic Marine Living Resources to the Twenty-Seventh Antarctic Treaty Consultative Meeting'. XXVII ATCM IP 65; and Commission for the Conservation of Antarctic Marine Living Resources. 2003. *Report of the Twenty-Second Meeting of the Commission*. CCAMLR Secretariat, Hobart.

# APPENDIX 3: Maps







# CCAMLR

Commission for the  
Conservation of Antarctic  
Marine Living Resources

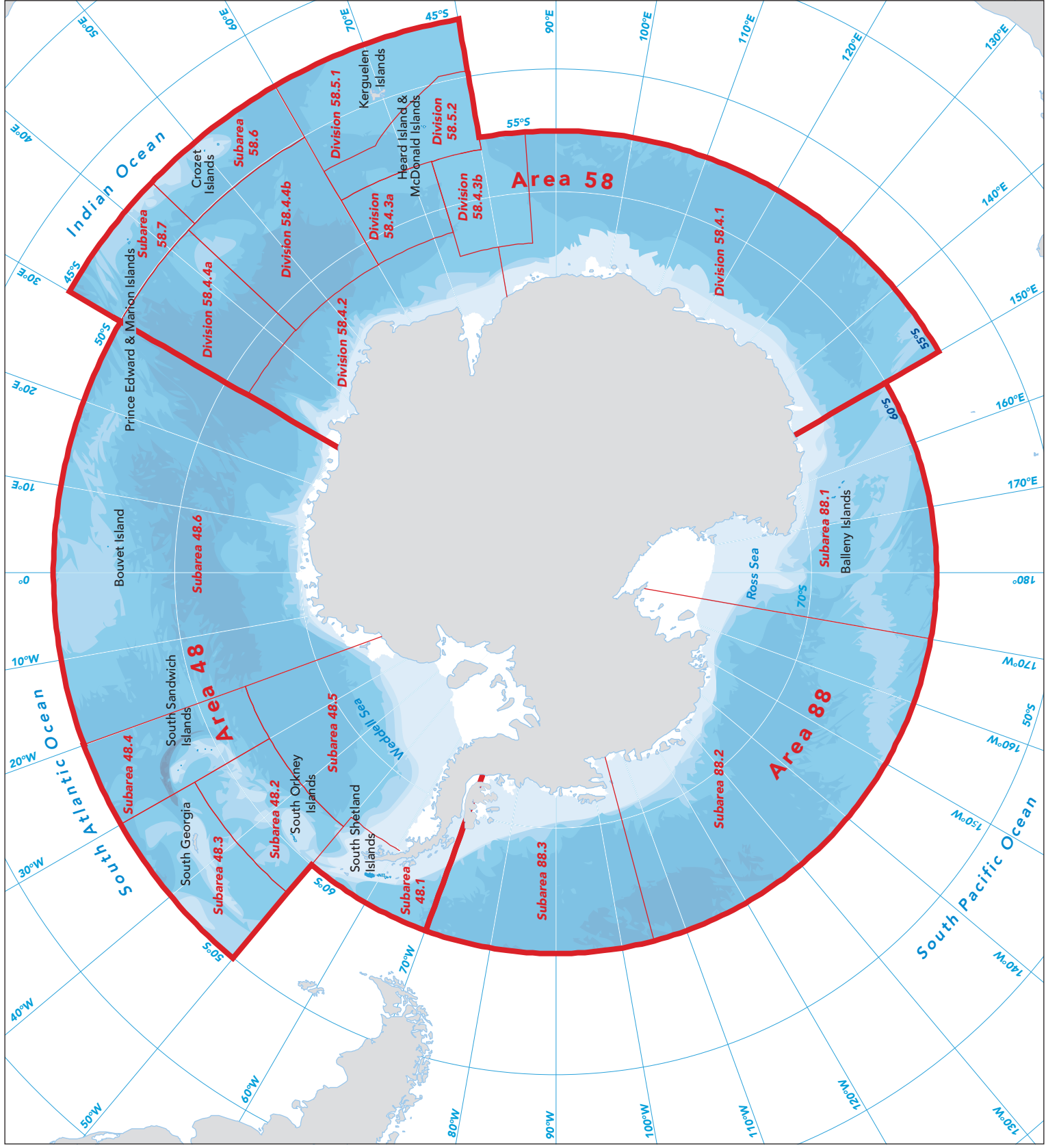
## Convention Area Statistical Areas



1:45 000 000

South Pole Lambert Azimuthal Equal  
Area projection

<http://gis.ccamlr.org>



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