

Illegal, Unreported and Unregulated Fishing in Historical Perspective

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Introduction

The condition of marine capture fisheries globally is one of the most urgent environmental problems of the early twenty-first century. Many experts now believe that the world's marine capture harvest peaked in the late 1980s, and although this peak was masked for some years by over-reporting of landings along the Chinese coast, the undeniable legacy is that key stocks around the world are overfished and declining in abundance (Pauly et al. 2002; Worm and Branch 2013). According to the Food and Agriculture Organization of the United Nations (FAO), in 2011, 28.8 % of global fish stocks were over-fished, 61.3 % were fully-fished, and only 9.9 % were under-fished and able to support increased exploitation. But the true picture may even be worse than these figures indicate. As much as 80 % of the world's catch may come from fisheries that are not formally assessed, and two-thirds of these may be depleted below a level that provides for maximum sustainable yields (Costello et al. 2012). Such figures highlight an emerging division in the status and prospects of marine fisheries globally, where Europe, North America and Oceania have comparatively well-assessed and sustainably-managed fisheries, in which exploited populations are most likely to be rebuilding, and the comparatively data-poor and poorly-managed fisheries of Asia and Africa, where too many populations remain over-exploited and continue to decline (Worm and Branch 2013; Mora et al. 2009; Pitcher et al. 2009). These developing regions, which depend heavily upon the marine environment for food security and employment and where the impediments to effective fisheries governance are often acute, represent the greatest challenges to fisheries scientists, managers, and conservationists today. At stake is the potential to

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rebuild and sustain marine capture harvests that, if managed properly, can underpin the food security and employment for many millions of people.

Among the most pressing of these challenges confronting global fisheries is the phenomenon of 'Illegal, Unreported and Unregulated fishing', or simply 'IUU fishing'. According to the FAO, IUU fishing 'remains a major global threat to the long-term sustainable management of fisheries and the maintenance of productive and healthy ecosystems as well as to the stable socio-economic condition of many of the world's small-scale and artisanal fishing communities' (FAO 2014). A joint statement by European Union and United States of America describes the phenomenon in similar terms, stating that 'IUU fishing is a global phenomenon with devastating environmental and socio-economic consequences, particularly for coastal communities in developing countries who rely on fisheries for their livelihoods or for protein' (Damanaki and Lubchenco 2011). These statements, made barely a decade after the FAO had first committed to tackle illegal fishing, reveal the depth of concern that has developed over the threat posed by such activities to the long-term conservation and socio-economic goals of fisheries governance. What is the scale of the problem? By its very definition, IUU fishing is an activity which seeks to avoid official monitoring and for which a deficient of reliable knowledge can be presumed to exist. Yet in 2009 one team of scientists produced the first baseline estimate of the global scale of IUU fishing. Their study found that, at the start of the twenty-first century, losses attributed to IUU fishing accounted for between US\$10 billion and US\$23.5 billion annually, representing between 11 and 26 million tons of wild-caught fish. Moreover, between 1980 and 2003, IUU fishing may have accounted for as much as 20 % of the world's marine capture harvest. The study also pointed towards a correlation between governance and the incidence of IUU fishing, with developing nations being also most at risk from illegal fishing activity (Agnew et al. 2009).

Producing a global estimate of IUU fishing is no straightforward matter. To arrive at their estimate, the authors of this landmark study examined a vast array of information; catch statistics, trade data, stock assessments, surveillance reports, specialist studies and expert opinions were all analysed to produce figures of the likely extent of illegal fishing globally. Such evidence was sufficient not only to produce estimates of the extent of IUU fishing, but also to gauge how it may have developed across time (Agnew et al. 2009). This raises an interesting point. The range of data sources that can be marshalled as evidence, and the temporal range of IUU fishing, suggests that it is phenomenon that is relevant not only to fisheries scientists, managers and conservationists – it suggests that it is also a concept that is relevant to environmental historians and historical ecologists concerned with changes in human-environment interaction across time. Can IUU be examined in historical perspective? This chapter addresses this question. It begins by outlining a short history of IUU fishing, locating the phenomenon in a wider context shaped by the global expansion of marine capture fisheries in the twentieth century and the changes to the regulation of fishing industries and control over maritime space and marine living resources that took place during this period. The chapter then looks closely at three historical case-studies of IUU fishing in the Indo-Pacific, one of the world's principal marine realms. The chapter concludes with a discussion of the potential for further investigations of IUU fishing from an historical perspective.

A Short History of IUU Fishing

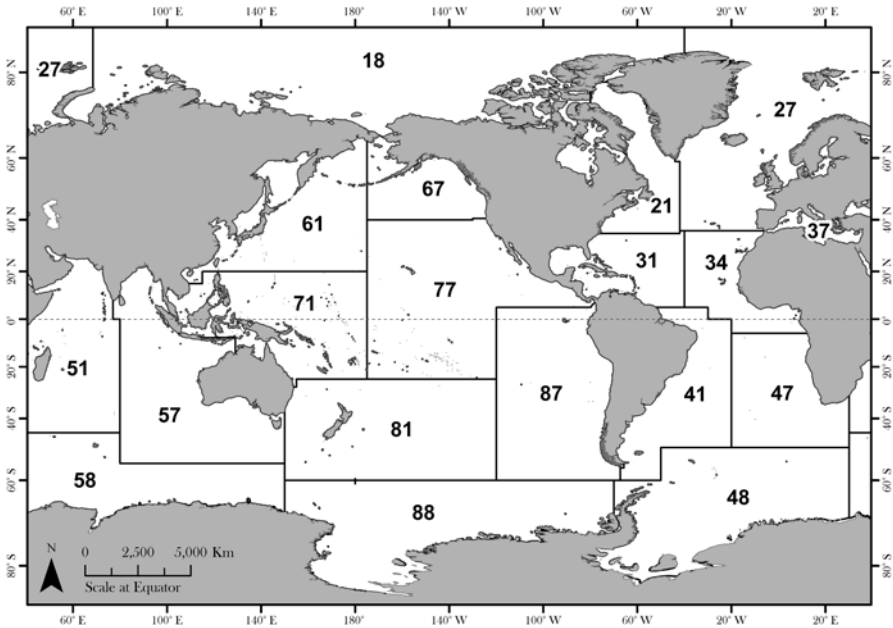
The first use of the term ‘Illegal, Unreported and Unregulated fishing’ was made by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) in a 1997 report that documented unauthorised fishing taking place within the Exclusive Economic Zones (EEZs) of the Southern Ocean (discussed later in this chapter). In 1999, as pressure mounted for a comprehensive response to illegal fishing, the FAO committed to the development of a global strategy that culminated 2 years later in the *International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing* (FAO 2001). This blueprint outlined the first comprehensive definition of IUU fishing: ‘Illegal Fishing’ referred to fishing carried out in a state’s territorial waters without state permission or in contravention of its laws, and to fishing on the high seas by a state-flagged vessel in contravention of laws and obligations agreed to between two or more states through a Regional Fisheries Management Organisation (RFMO); ‘Unreported Fishing’ covered the non-reporting or misreporting of catches in contravention to national or regional regulations and procedures; and ‘Unregulated Fishing’ covered fishing by vessels without nationality or by state-flagged vessels in waters where the state is not party to an RFMO, and fishing in waters where no management measures exist and which is inconsistent with international responsibilities to conserve fish stocks (FAO 2001). Such a wide-ranging definition necessarily applied to a multitude of activities, and the IPOA’s recommendations were correspondingly broad, addressing: state responsibilities to conserve fish stocks and respond to illegal fishing; ‘Flag State’ responsibilities to ensure vessels avoid breaching laws and correctly document their catches; the responsibilities of coastal states to police territorial waters; and ‘Port State Measures’ designed to prevent the landing of illegally-caught fish and the harbouring of illegal fishing vessels. The plan also recommended that the FAO and developed nations support developing nations in their efforts to mitigate illegal fishing (FAO 2001).

The release of the IPOA heralded more than a decade of sustained international interest in addressing IUU fishing. In 2003 the Organisation for Economic Co-operation and Development (OECD) committed to a second major investigation into the economic, social and environmental aspects of the problem. The OECD reports on ‘Fish Piracy’ revealed that IUU fishing had become more than a problem for scientists and managers; it was also of concern to conservation organisations due to by-catch of protected marine species and seabirds, and to labour and human rights organisations on account of poor working conditions and safety records aboard illegal fishing boats (OECD 2004, 2005). Other non-governmental organisations to respond to the problem included the Marine Stewardship Council (MSC), which was founded in 1997 to assist consumers to purchase seafood from sustainably-managed fisheries (Roberts 2012); Greenpeace and the World Wild Fund for Nature (WWF), particularly in relation to issues surrounding by-catch in IUU fisheries; and the International Labour Organization (ILO), to protect the interests of fishers working aboard illegal fishing vessels (OECD 2004). Among the

challenges faced by the FAO, RFMOs, NGOs and national fisheries agencies were the common practises of 'Flag of Convenience' (FoC) fishing, wherein vessels operated under the flags of countries that are unwilling or unable to exert effective control over national fleets, and the transshipment of catches at sea, which allowed vessels to launder catches illegally (Gianni and Simpson 2005). Such problems pointed to the need to strengthen international regulations. The IPOA-IUU had developed out of the FAO's non-binding 1993 Fish Stock Agreement and the 1995 Code of Conduct for Responsible Fisheries, but a more rigorous approach was needed to replace these instruments. In 2009, the FAO developed the *Agreement on Port State Measures to Prevent, Deter and Eliminate IUU Fishing*, the first legally-binding measure designed to combat IUU fishing by blocking the flow of illegal and unreported fish to markets and deterring FoC vessels from operating on the high seas (FAO 2010). By this stage, many countries in Europe, North America and Australasia had also implemented their own national plans to address IUU fishing, at the same time as offering assistance to developing nations to address the problem.

This raft of measures alludes not only to the rise but also to the persistence of IUU fishing since the late 1990s. Since 1990 the incidence of illegal and unreported catches is believed to have risen in five major ocean regions (the Southwest Atlantic, Eastern Indian, Northwest Pacific, Eastern Central Pacific and Antarctic; see Map 1) and to have fallen in 11 regions, although in only 6 of these regions (Northwest, Northeast, Western Central and Southeast Atlantic, Northeast and Southwest Pacific, and the Antarctic; Map 1) did the IUU catch account for less than 10 % of the total reported catch in 2003 (Agnew et al. 2009). In 2013 the US Congress named ten nations whose vessels, including FoC vessels, engaged in IUU fishing over the preceding 2 years; Columbia, Ecuador, Ghana, Italy, Mexico, Panama, the Republic of Korea, Spain, Tanzania and Venezuela (NOAA 2013). A range of factors underpinned the continuation of IUU fishing despite a determined international response. Strong market demand for wild-caught seafood irrespective of the origins or circumstances of capture, fuelled by ongoing population growth and rising living standards in the developing world and particularly in Asia, was the root cause of the problem. Substantial over-capacity in global fishing fleets at a time of dwindling fish stocks helped to encourage risk-taking in the form of illegal or unreported fishing. Finally, national governments and RFMOs were also faced with the perennial challenge of monitoring what actually takes place in EEZs or on high seas, where maintaining effective surveillance can be an expensive activity, and one that is often fraught with both legal and practical difficulties. The lack of effective state control is recognised as one of the main reasons why IUU fishing proved so difficult to halt during the 2000s (NOAA 2013).

From a longer-term point of view, however, the rise of IUU fishing is best understood within the context of the more far-reaching changes to marine capture fisheries that took place during the twentieth century. When the FAO first began to collect statistical data on fisheries production in 1950 the global fishing industry was in the early stages of a vast expansion in fishing power made possible by the rapid adoption of industrial technologies including fossil-fuel powered vessels, synthetic fishing lines, sonars and other fish-finding devices, and on-board refrigeration. From a



Map 1 Statistical areas for fishery purposes (Source: FAO Fisheries and Aquaculture Department [online]. Rome. <http://www.fao.org/fishery/area/search/en>. Northwest Atlantic is area 21; Northeast Atlantic 27; Western Central Atlantic 31; Southwest Atlantic is Area 41; Southeast Atlantic 47; Eastern Indian 57; Northwest Pacific 61; Northeast Pacific 67; Southwest Pacific 81; Eastern Central Pacific 77; Antarctic 48, 58 and 88)

harvest of just over 20 million tons, the global catch rose to around 90 million tons by the late 1980s. Since that time, although aquaculture has grown significantly and so underpinned the continued rise of total fisheries production, wild capture fisheries have been in decline despite the spatial expansion of fishing effort across almost all of the world’s oceans (Swartz et al. 2010; Watson et al. 2012). Considering that the world’s population rose from 2.5 billion to 6 billion between 1950 and 2000, the levelling off and then decline of the global capture harvest precipitated an increasing scarcity of fish that has yet to be remedied through large-scale and sustained recovery of over-exploited stocks. Historians have long observed that fishers, faced with declining catches, tend to shift to new fishing grounds, adopt new gears, and switch to new target species (e.g. Butcher 2004). Yet from the late 1980s onwards these traditional responses were increasingly likely to result in IUU fishing. Around the world, fisheries governance began to shift by the end of the twentieth century towards the adoption of property rights through the imposition of licensing arrangements and quota restrictions, a process that has left few stocks, even high seas stocks and highly migratory species, remaining under open-access arrangements. It is within this context that ‘IUU fishing’, which contravenes fisheries laws and regulations and often breeches property rights over wild stocks, emerged abruptly as a major international problem in the 1990s and 2000s (Hannesson 2006).

The shift to property rights in global fisheries heralded a fundamental reversal on a question that lies at the crux of IUU fishing – who owns the fish in the sea? In the Western conception of the Law of the Sea, the ‘right to fish’ was traditionally open to anybody who had the wherewithal to venture out upon the ocean, a principle famously espoused by the seventeenth century Dutch jurist Hugo Grotius in his *De Mare Liberum* (*The Freedom of the Seas*, 1609). In this seminal work Grotius argued that the world’s oceans had been gifted by God for the common use of mankind, for navigation as well as for fishing; the sea itself was boundless and the fish within it inexhaustible, he reasoned, and therefore could not become the property of any one person or state. Three decades later the Englishman Jon Selden responded in his *Mare Clausum* (*The Closed Sea*, 1635) by arguing for the longstanding existence of state dominion over ocean waters and the right of sovereigns to claim jurisdiction over maritime territory and the fish stocks found therein. Both principles ultimately found expression in the Law of the Sea – during the nineteenth century most Western nations claimed territorial waters to a distance usually extending three nautical miles (nm) seaward of their coastlines, a limit that was set by the maximum range that a cannon could be fired from the shore, thus marking the reach of a state’s power. Beyond this narrow coastal strip the oceans remained the common property of all people, and the marine life of the high seas could be freely exploited by anyone. In English-speaking countries, this right to fish was generally implied in common law, a situation mirrored in other major European maritime nations (Rothwell and Stephens 2010).

The doctrine of *Mare Liberum* in relation to ocean fisheries lasted for over 300 years. In its original conception it was, as maritime historians have observed, based on a simple reality; that ‘the resources of the ocean were in fact endless and that there was no chance of extinction’, so that exploitation by one nation could not limit another nation’s potential to do the same (Heidbrink 2008). It was also the case that relatively little deep-sea fishing took place due to the expense and difficulties of preserving catches and conveying it to markets, when coastal and inshore fisheries could readily supply demand for fish products. Some of the first deep-sea and distant water fisheries, such as whaling and the North Atlantic fishery for Atlantic cod (*Gadus morhua*), were also subject to some of the first multi-lateral agreements designed to conserve stocks for sustainable exploitation. The rapid expansion of global fisheries in the second half of the twentieth century finally overturned the basis upon which open-access fisheries rights were founded. Faced with the prospect of near or total collapse of fishing industries, a new Law of the Sea developed, with the United Nations Third Convention of the Law of the Sea (UNCLOS III) formalising in 1982 a series of 200 nm Exclusive Economic Zones (EEZs) for the world’s coastal nations (Rothwell and Stephens 2010). By the end of the twentieth century most of the world’s major fishing nations had developed treaties for the management of migratory and High Seas fish populations not covered by EEZs and remaining vulnerable to over-exploitation by distant-water industrial fleets. The world’s oceans had been enclosed, creating the conditions where illegal and unregulated fishing could occur on an extensive global scale (Hannesson 2006).

Yet it would be incorrect to presume that such conceptions of the ‘right to fish’ were universal, a point that bears on the rise of IUU fishing in several parts of the

developing world. Until the twentieth century most marine fisheries in Southeast Asian, Southwest Pacific and Northern Australian waters were governed by cultural-legal systems of inherited rights, customs and privileges known as Customary Marine Tenure (CMT). CMT can take on diverse forms, but at its core is the simple principle that access to coastal and near-shore waters and the marine resources contained therein is not open to all but rather subject to an often complex system of clan or family ownership that governs who fishes, where and when fishing takes place, and what is caught (Cordell 1989; Sharp 2002). Its basis lies in balancing the needs of a community for food with the imperative of guaranteeing sustainable exploitation to conserve resources across the long-term, and of preventing individuals from acting in ways that are harmful to the interests of the group as whole (Kurien 2002). Through the operation of CMT arrangements, many traditional fisheries were historically able to avoid the ‘Tragedy of the Commons’ scenario that plays out, at least in theory, in open-access fisheries, where the commonly-owned resource inevitably becomes depleted over time (Berkes 1985). However, CMT systems have proven inherently vulnerable to the impact of colonialism and the forces of globalisation, among which are included technological change, rapid population growth, urbanisation, and environmental degradation. In some cases, such as the marine fisheries of the South Pacific, important fishery resources only declined after traditional CMT arrangements were subsumed by the commercial imperatives that result from incorporation of local economies into global economic systems, leading to decline of stocks that once supported coastal communities (i.e. Malm 2001). This, in turn, can drive small-scale fishers towards illegal fishing practises as a substitute for the sustainable livelihoods once derived from fishing under CMT arrangements.

Case Studies of IUU Fishing from the Indo-Pacific

Many examples of Customary Marine Tenure come from the seas of the Indo-Pacific, one of the world’s principal maritime regions. Biogeographically, the Indo-Pacific refers to the warm tropical waters that encompasses the Indian Ocean north of the Tropic of Capricorn and extends in the centre of the Pacific Ocean. These seas have the highest levels of marine diversity anywhere on Earth, with the Coral Triangle, the ‘global centre of marine biodiversity’ in the waters bordered by Malaysia, Indonesia, Papua New Guinea and the Solomon Islands, laying at the heart of this ecoregion (Spalding et al. 2007). Geopolitically, the Indo-Pacific comprises the maritime space that extends from East Africa and the Persian Gulf to Japan and the Southwest Pacific, encompassing the ‘island continent’ of Australia and the ‘maritime continent’ of Southeast Asia, and touching the shores of the world’s two emerging superpowers, China and India (Medcalf 2010). This geopolitical region embraces some of the world’s principal fishing nations, including Japan, Thailand, Indonesia, the Philippines, Vietnam, Myanmar, Malaysia, South Korea, and Taiwan (FAO 2014). Indo-Pacific nations also have some of the world’s largest EEZs, including Australia (third largest in the world),

and Indonesia (sixth). The region was also at the forefront of the global expansion of marine capture fisheries in the second half of the twentieth century (Christensen 2014; Butcher 2004). Between 1950 and 2000 the fishing fleets of Asia and Oceania, the two FAO statistical regions that constitute the Indo-Pacific, increased their recorded marine catches by 422 % and 1218 % respectively, against a global average of 344 % (Watson and Pauly 2013). This growth was driven by the rapid uptake of modern industrial fishing technologies and an inexorable spread in the geographic and bathymetric frontiers of fishing activity, which in the case of the Asia, produced a 25-fold increase in effective fishing power across the same 50-year period (Swartz et al. 2010). In the early twenty-first century the Indo-Pacific also highlights the emerging global division in marine capture fisheries, containing both the well-performing fisheries of Oceania as well as the comparatively poorly-performing fisheries of Asia (Williams 2007; Mora et al. 2009).

Perhaps unsurprisingly, the Indo-Pacific has also proven to be highly prone to IUU fishing. Indonesia presents an extreme example. The country has an enormous problem with illegal and unreported fishing, accounting for as much of 30 % of the world's IUU catch, and worth a staggering 100 trillion Indonesia Rupee (around US\$8.5 billion) each year (Syafputri 2014). Adjoining countries such as Thailand and the Philippines also have substantial illegal and unreported fisheries, compounded as in the case of Indonesia by lax enforcement, limited scientific knowledge, and endemic corruption (Williams 2007; Nurhakim et al. 2008). At the other end of the scale there is Japan, the world's second-largest consumer of seafood after China, and a major market for IUU catches. To take one example, Japan is the destination for around three-quarters of the global catch of Atlantic Bluefin Tuna (*Thunnus thynnus*), which was illegally over-fished by an estimated 44 % in excess of international quotas between 2005 and 2011, during which time stocks became severely depleted and a major concern to fisheries management agencies and conservation organisations (Gagern et al. 2013). On the other hand, the Indo-Pacific also contains some of the world's leaders in the fight against IUU fishing such as Australia and New Zealand. The three case-studies examined below relate principally to Australia's experience with IUU fishing: the Southern Ocean fishery for Patagonian toothfish, which is important in helping to define IUU as a legal and political concept; the presence of Indonesian fishers in the Australian Fishing Zone (AFZ), which offers an insight into the complex socio-economic drivers of IUU fishing; and systematic Japanese under-reporting of Southern Bluefin Tuna catches, which exposes the strength of demand for seafood, irrespective of its mode of capture, that provides one of the main drivers of IUU fishing globally.

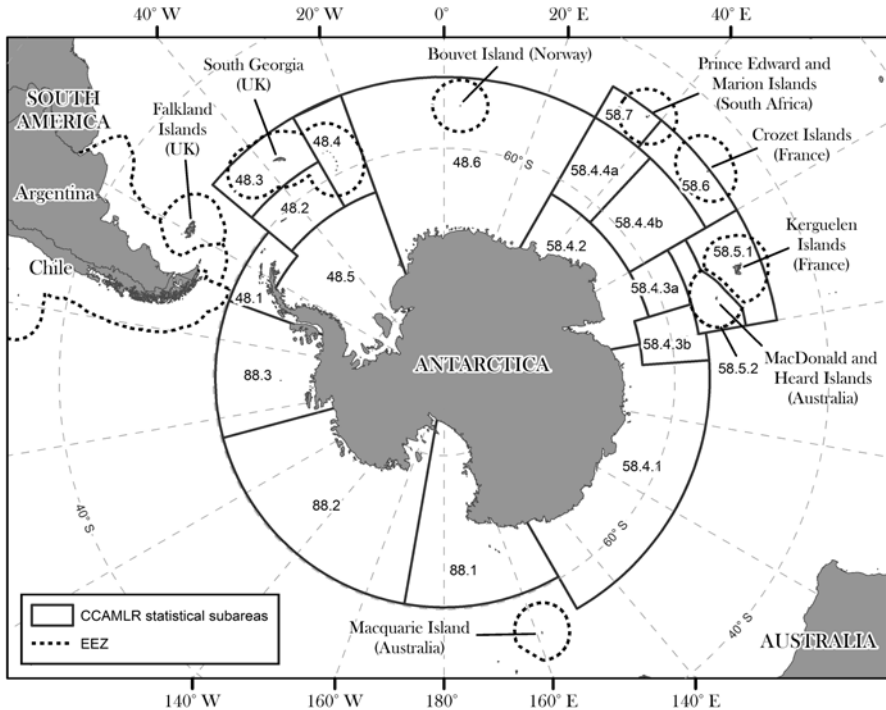
Patagonian Toothfish

Patagonian toothfish (*Dissostichus eleginoides*) is a cod icefish that inhabits seamounts and shelf areas off South America and the sub-Antarctic islands. A migratory species that can grow to in excess of 2 m and 100 kg, it has become the most

important species of fish commercially harvested in the Southern Ocean, although exploitation of it only began on an appreciable scale in the late twentieth century. Patagonian toothfish was taken as by-catch by trawlers and longliners during the 1970s, before the first targeted toothfish fisheries developed in the mid-1980s off the Chilean coast by local vessels utilising deep-water demersal longlines, and in the vicinity of Kerguelen Island (France) by Russian and Ukrainian trawlers. Longlining expanded to the Kerguelen shelf, Crozet Island (France), Prince Edward Islands (South Africa) and Heard, McDonald and Macquarie Islands (Australia) between the early- and mid-1990s (Agnew 2000; Baird 2006; Martin et al. 2010). The popularity of Patagonian toothfish in the restaurant trade in the United States and Europe, where it is known as Chilean Sea Bass, and Japan, where it is called Mero, helped to drive this expansion. Market prices more than tripled between the early-1980s and mid-1990s, rising from less than US\$5.00 per kg to US\$15.00 per kg, underpinning an increase in reported landings from 5000 tons in 1983 to 40,000 tons in 1991, with catches fluctuating between 30,000 and 40,000 tons for the remainder of the decade (Bruce Knecht 2006).

This fishing took place within EEZs of parties to the CCAMLR. The Commission was established in 1982 in response to growing concerns over increasing catches of krill in the Southern Ocean, a key component of Antarctic marine ecosystems upon which other populations of marine life depended (Baird 2006). In 1985, the CCAMLR established a program to monitor harvests in the Antarctic and sub-Antarctic, providing a framework for assessing toothfish catches over subsequent years. The first catch limits were imposed in 1990. Concerns over the stock's status were first raised at the Commission's meeting in 1993 when it was reported that the biomass around South Georgia could be depleted to as much as 30 % of the unfished population. The first infringements of CCAMLR regulations were also reported at this meeting (Baird 2006). In 1995, following further observations of fishing activity outside of the designated season, the Commission reported that, in the area around South Georgia, the unreported Patagonian toothfish catch was as high if not higher than the reported catch, and that the reported catch may have represented only 40 % of the total catch over the past 4 years. A year later, further reports were received of the eastward movement of unregulated fishing towards Kerguelen Island, Prince Edward Island, and the Heard and McDonald Islands, linked to the reduction of catches in the traditional fishing grounds off South America (Map 2; Agnew 2000). The growing concern of member states over this activity led to the appearance in the Commission's 1997 report of the inaugural reference to 'IUU fishing' in international fisheries jargon, when it was reported that 'illegal, unregulated fisheries and unreported catches today exceed fishing activity by a factor several times over' (CCAMLR 1997). As many as 90 vessels were thought to be operating without authorisation at this time, when the IUU catch peaked at over 32,000 tonnes, or 72 % of the total Patagonian toothfish catch (Agnew 2000).

This rise of unregulated and illegal fishing was facilitated by the sheer size and isolation of these seas, making surveillance of EEZs and enforcement of regulations an enormous practical challenge. The Australian Government lost no time in addressing this problem. Armed fisheries patrols of the nation's sub-Antarctic EEZs



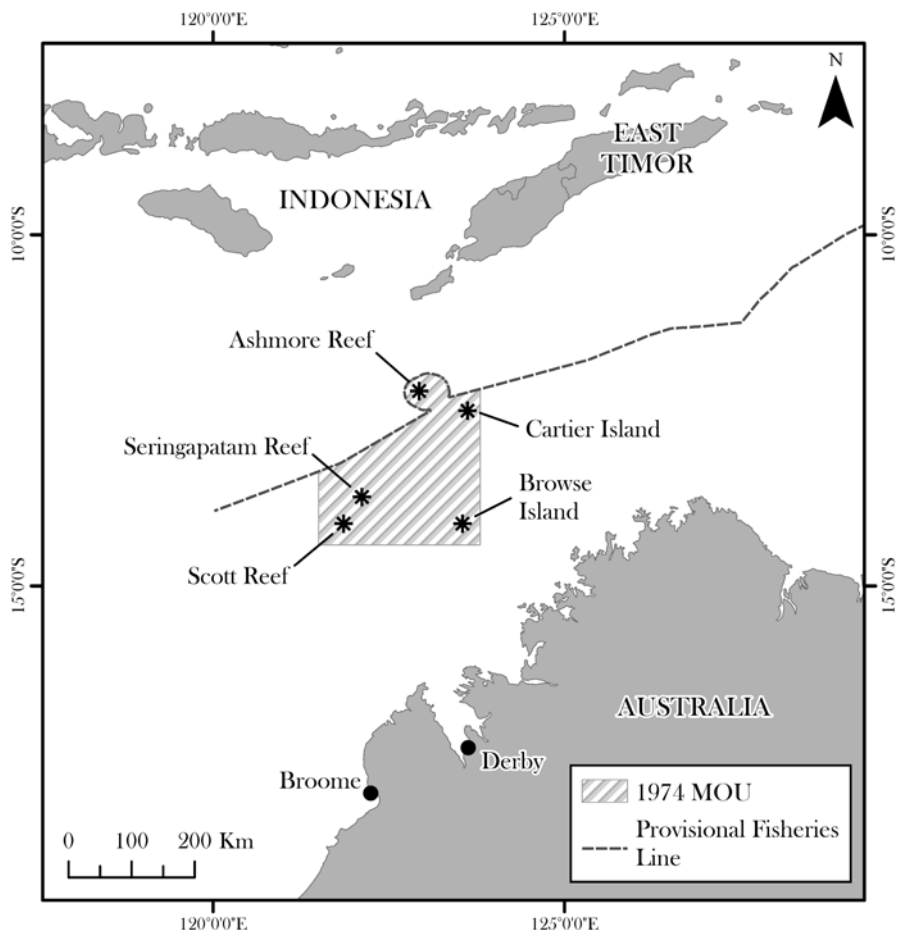
Map 2 Exclusive economic zones in the CCAMLR area (Source: Smith and Appleyard 2002; VLIZ 2014)

began in 1997 using vessels of the Royal Australian Navy and Australian Customs Service, leading quickly to a series of vessel seizures and prosecutions for IUU fishing. By 2004 a total of eight vessels had been apprehended, and many others warned off, by these patrols; one famous incident in 2003 saw the Customs vessel *Southern Supporter* engage in a 3-week, 2200 mile chase of the Uruguayan-flagged trawler *Viarsa I*, culminating in the seizure of the trawler and the arrest of its crew (Bruce Knecht 2006). In late 2003 the Government announced a renewed commitment to full-time armed patrols as part of a comprehensive strategy to protect fisheries resources, and a new vessel, the *Oceanic Viking*, entered Customs service to monitor the distant Southern Ocean territories. It proved to be a successful approach. The last vessel to be seized by Australian authorities was a Cambodian-flagged factory ship in 2005. Since this time, it is believed that no IUU fishing has taken place in the waters off Heard and McDonald Islands. France, the United Kingdom and New Zealand also enhanced enforcement in their EEZs during the 2000s (Phillips and Larcombe 2008; Martin et al. 2010).

Yet IUU fishing has persisted across the wider CCAMLR area, despite this commitment to surveillance and the introduction of a raft of additional measures. From 2001 onwards, Vessel Monitoring Systems (VMS) were mandatory aboard all vessels licensed to fish for Patagonian Toothfish, providing a cost-effective means for monitoring the positions of vessels in the remote Southern Ocean. A requirement for all gears to be marked to prevent vessels cutting longlines and departing when approached for inspection was also introduced (Agnew 2000). Another measure, quite innovative at the time of its adoption in 2001, was the introduction of a Catch Document Scheme (CDS) for the Patagonian Toothfish fishery designed to demonstrate if toothfish have been caught in compliance with conservation measures by tracking landings and trade (Agnew 2000). In 2002, an IUU Vessel Database was also created by the CCAMLR to prevent vessels changing flags and otherwise seeking to obscure their identity to avoid restriction or prosecution for IUU fishing. Notwithstanding these measures, illegal and unreported fishing remained a significant problem for the Patagonian toothfish fishery. CCAMLR estimates showed the IUU totalling 19,215 tonnes between 2003 and 2007, but analysis of market data indicated an IUU catch of 26,465 tonnes, figures that suggest the Commission may have seriously under-estimating the extent of illegal catches, which would in turn have a significant bearing on long-term stock management models (Lack 2008).

Indonesian Fishing in the Australian Fishing Zone

The Arafura and Timor Seas separate Northern Australia from the Malay Archipelago and are today divided between the territorial waters of Australia and Indonesia. These waters also have a rich history of marine resource exploitation that can be traced back to a period that predates the British annexation of the Australian continent and the subsequent opening of the continent's northern coast to European settlement in the nineteenth century. The Bajo or Bajau Laut people and other 'sea nomads' of eastern Indonesia made regular visits to the Australian coast and its adjoining reefs and islands (see Map 3) from the early 1700s to gather trepang, or *bêche-de-mer*, an edible sea cucumber of the class holothurian, which was traded through Makassar to supply Chinese demand for this product as a culinary delicacy and pharmacopeia (McKnight 1978; Schwerdtner Mánez and Ferse 2010). This voyaging continued after the British laid claim to Australia in 1788, before the 'Makassan' fishers were evicted from the northern coast through the imposition of custom duties and a licensing system by Australian authorities in the early 1900s. Less frequent visits continued, however, to the offshore islands and reefs during the twentieth century. Here, Indonesian fishers took not only trepang, but also trochus shell, turtle, and shark fins from their traditional *praus*, a type of sail-powered vessel common in the Malay Archipelago. The scale of such voyaging is unknown, as contact with Australian authorities was sporadic, and indeed, after the decline of the commercial pearl-shell industry in the mid-twentieth century these waters were



Map 3 Australia-Indonesia Provisional Fisheries Surveillance and Enforcement Agreement line and 1974 Memorandum of Understanding (MOU) 'box', Timor Sea (Source: Geoscience Australia)

largely unutilised by Australian-based fishers and rarely visited by Australian mariners (Campbell and Wilson 1993; Powell 2010).

Marine resource use in these waters began to change following the official division of the Arafura and Timor Seas, which heralded a new phase of regulation and enforcement in what became part of the AFZ. The creation of maritime borders between Australia and Indonesia took place within the wider context of the enclosure of the world's oceans. In 1957, a year before the first 'Cod War' provoked by the Iceland's declaration of a 12-mile exclusive fishing zone in the North Atlantic, Indonesia declared itself to be an archipelagic state and laid claim to all waters within 12 nautical miles of a baseline drawn around the archipelago; Australia, which had unilaterally laid claim to all living natural resources of its vast continen-

tal shelf in 1952, 12 years before such claims were legitimised by the first United Nations Convention of the Law of the Sea (UNCLOS I), also laid claim to a 12-mile zone in 1968. During 1979 both nations extended their claim to 200 nautical miles, with the overlapping claims in the Timor and Arafura Seas set by a median line between Australia and Indonesia. These claims were formalised by UNCLOS III in 1982 (Campbell and Wilson 1993). A year earlier, the two nations had reached a fisheries surveillance and enforcement arrangement, agreeing to refrain from monitoring and enforcement action against boats licensed by the other outside of their respective EEZs. There was, however, an important exception made by the Australian Government. Following the 1968 claim to a 12-mile zone Australian fisheries authorities permitted Indonesian fishers access to the remote islands and reefs off the North-West coast, provided the purpose of the visits was 'subsistence fishing'. In 1974 a formal Memorandum of Understanding (MOU) was agreed to by the two nations, whereby Indonesian fishers were granted access rights to certain reefs and islets in the Timor Sea for 'traditional' fishing, defined as 'fishermen using traditional methods and traditional vessels consistent with the tradition over decades of time, which does not include fishing methods or vessels utilising motors or engines' (Stacey 2007; Fox 1998). The principle was to allow small-scale artisanal fishing to continue, but prevent commercial fishers crossing from Indonesia to fish in Australian waters, so as to conserve marine resources inside the MOU 'box' area (Map 3).

The signing of this agreement signalled the start of a new program of surveillance by Australian authorities. Much of this effort was directed at monitoring activities inside the MOU box. Three main types of small-scale fishing were taking place at this time in the waters between Indonesia and Australia: the trepang fishery; a shark fin fishery, supplying fins for the lucrative Chinese market; and for trochus shell (sea snails of the genus *Trochus*), prized for its nacre or mother-of-pearl (Campbell and Wilson 1993; Stacey 2007). It was not long before Indonesian fishers were being prosecuted for illegal fishing in the AFZ. A total of 74 violations of the MOU were reported in 1975, the first year that the agreement operated; for the period 1988–2001, for which more reliable figures are available, a total of 107 apprehensions occurred within the MOU box, while an additional 48 vessels were apprehended outside of the designated MOU waters between 1988 and 1999, half of which were targeting shark (Fox and Sen 2002). Most of the vessels apprehended inside MOU waters failed to meet the definition of 'traditional fishing' due to the gear types being used or because the vessels were equipped with engines or radios in contravention of the 1974 agreement. Other vessels, particularly those engaged in the shark fin trade, represented more opportunistic ventures to prey on the relative abundance of stocks in Australian waters. Apprehended boats, including vessels not classified as 'traditional', were seized and, taken back to the Australian mainland, burned in order to destroy the vessel and provide a public form of deterrence to other fishers. Prosecuted fishers were often sentenced to serve time in Australian prisons, before being repatriated to Indonesia. Australian authorities also embarked

on education campaigns about fisheries regulations in parts of eastern Indonesia (Fox 1998; Stacey 2007).

Yet such measures did not halt the activities of Indonesian fishers in Australian waters. Against this backdrop of persistent infringements against Australian fisheries law, and confronted by the realities of custodial sentences for impoverished small-scale fishers and the policy of burning boats, which destroyed the livelihoods of entire families and threatened to exacerbate cycles of debt and law-breaking, historians and anthropologists have worked to provide context to the presence of Indonesian fishers off Australia's northern coast. Their work has pointed to the problems surrounding the definition of 'traditional fishing' and the juxtaposition between traditional and commercial fisheries, arguing that such conceptions ignore the longstanding commercial nature of trepang fisheries and incorrectly present groups such as the Bajo as static and unchanging pre-modern societies (Stacey 2007; Fox et al. 2009). It also highlights the tendency for Australian authorities to group together fishers such as the Bajo, which have longstanding ties to the Timor and Arafura Seas, with other Indonesian fishers whose presence off the Australian coast is a more opportunistic and recent phenomenon. Another issue brought to the fore is the difficulty created by obliging fishers to avoid equipping vessels with radios or other navigational equipment, which can make fixing the position of maritime boundaries difficult, and the potential dangers that result from prohibiting engines aboard vessels that frequent seas that are remote from settled coasts, lack fresh water, and are prone to tropical storms and cyclones (Campbell and Wilson 1993). These studies also highlight the fact that, due to the severe depletion of marine resources in Indonesian waters, the risk of fishing illegally in the comparatively richer waters of Australia hold strong appeal both to small-scale fishers who lack alternative livelihoods as well as to larger commercial syndicates attracted by the potential profits of the shark fin trade. For all these reasons, Indonesian fishing in the AFZ remains an intractable, ongoing example of IUU fishing.

Southern Bluefin Tuna

Southern Bluefin Tuna (*Thunnus maccoyii*) is a long-lived, migratory species found in the southern Atlantic, Indian and western Pacific Oceans. A close relative of the Atlantic Bluefin Tuna, it is one of the most prized of all the tuna and tuna-like species, with single fish occasionally fetching more than US\$100,000 on the Japanese sashimi market (Ellis 2008). Commercial exploitation of the species is believed to have commenced only in the late 1940s. The fishery initially developed along diverse lines, comprising of Australian and New Zealand pole-and-line and purse seine fisheries in coastal waters, and Japanese longlining, initially in the waters south of Java and off the Western Australian coast before spreading in the 1960s and 1970s across a wide swathe of the Southern Indian, Southern, South Pacific and South Atlantic Oceans, aided by the development of ultra-low-temperature (ULT) freezing and strong state support for the distant-water fleet. Korea and Taiwan also

targeted Bluefin tuna through distant-water longlining in the 1970s, 1980s and 1990s (Caton 1994). The harvest peaked at around 80,000 tonnes in the early 1960s, and although catches were maintained for some time by the geographical expansion of effort, it began to decline during the 1970s. Stocks collapsed off the Southeast Australian coast in the late 1970s, and after studies pointed to excessive harvest rates, Australia moved in 1984 to drastically cut the size of its tuna catch through the imposition of quota restrictions. New Zealand and Japan also cut their catches shortly after, when the three nations agreed to the introduction of a Total Allowable Catch (TAC) for the fishery (Polacheck 2012; Adams 2014). But the species continued to be over-fished. In 2011 Southern Bluefin Tuna was added to the International Union for the Conservation of Nature's (IUCN) Red List of Threatened Species, when the population was assessed to have dwindled to 85 % of its virgin biomass, with no prospects of a recovery in sight (Collette et al. 2011).

This severe decline, which in hindsight was clearly exacerbated by IUU fishing, occurred in spite of international efforts to manage the stock sustainably. Although declining catch rates were first observed in the 1970s, the Australian action to cut its national catch in 1984 marked the beginning of this effort. Japan, after initially refusing to accept the quotas suggested by Australia and New Zealand, agreed to a TAC after its vessels were banned from Australia's EEZ in 1985. By 1989, when the TAC was cut by 50 %, Japan reported for the first time that its longline fleet had reached the new catch limit. These arrangements were formalised in 1993 through the establishment of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) to formally manage Southern Bluefin Tuna stocks amongst these three principal fishing nations. Following a sharp spike in catches by other nations, the CCSBT was expanded through the inclusion of Korea (2001), Taiwan (2002), and Indonesia (2008), with catch shares allocated to each of these countries. The catch limits for Australia, New Zealand and Japan remained largely unchanged between 1989 and 2007 (Polacheck 2012). However, despite being set by the CCSBT at a level designed for 'the conservation and optimal utilisation' of Southern Bluefin Tuna, scientific opinion tendered to the Commission by Australian and New Zealand experts during the 1990s suggested that stocks were not meeting recovery targets. Japanese scientists, on the other hand, tended to adopt a more optimistic position on the stock's capacity to withstand fishing pressure and rebuild to a larger population size. Indeed, contrary scientific assessments were a feature of CCSBT meetings during this period, with the more cautious positions tendered by Australia and New Zealand being ultimately borne out by the revelations of systematic under-reporting revealed during the mid-2000s (Adams 2014).

Concerns about potential unreported catches of Southern Bluefin Tuna had in fact first been raised in the early 1990s, shortly after the catch limits agreed to by Japan began to actually restrict its fleet's catch, due to the incentive quotas create for under-reporting, high-grading, misreporting species and discarding of catches. In the late 1990s, Australian observers detected an apparent anomaly in Japanese market statistics, which indicated that the amount of Southern Bluefin Tuna being sold was substantially more than the total national catch allocations under the CCSBT (Polacheck 2012). A preliminary analysis in 2000 indicated that Japan's market

sales of Southern Bluefin Tuna may actually have been double the nation's quota, but the concerns this created were not pursued in a formal setting due to uncertainty around the reliability of market data and challenges of interpretation. But the concerns persisted, and in 2005, the Australian Government commissioned a new, independent analysis of the market data. Following its finding that the amount of Southern Bluefin Tuna sold in Japan was substantially higher than could be accounted for in official catch statistics, a second major investigation was jointly commissioned by Australia and Japan in 2006 (Polacheck 2012). This resulted in the report *Independent Review of Japanese Southern Bluefin Market Data Anomalies*, which despite never being released in full due to commercial and diplomatic sensitivities, was nonetheless discussed at CCSBT meetings and its findings leaked to journalists; the report revealed that some 178,000 tonnes of Southern Bluefin Tuna had been taken by Japan in excess of its quota over the period 1985–2005, of which 138,000 tonnes was taken following the establishment of the CCSBT, an illegal and unreported catch worth an estimated US\$8 billion, and which had been a major contributing factor to the depletion of the stock to a critical level (Darby 2007; also Polacheck 2012; Polacheck and Davies 2008). At their meeting for 2006 the CCSBT agreed, with Japanese consent, to reduce Japan's annual quota by 50 % for the period 2007–2011 (Polacheck 2012).

Conclusion: IUU Fishing in Historical Perspective

The diverse case-studies examined above point to a set of common themes which can assist with the study of IUU from an historical perspective. Viewed in the context of the long-term relationship between human societies and the marine environment, IUU fishing emerges as a contemporary problem with fundamentally modern causes – arising at the end of the twentieth century as an outcome of the rapid expansion of capture fisheries, increasing scarcity of wild fish stocks, and the fundamental change to the 'right to fish' linked to the enclosure of the oceans. Moreover, its underlying causes are associated with globalisation in the modern era, involving population growth, the integration of economic systems and the increase of world trade, the rise of Asian economies, environmental degradation, and arguably, the growing disparity between rich and poor around the world. In this sense, IUU fishing can be considered as one of the many problems that have arisen in global marine environments during the twentieth century, which include habitat destruction, pollution, the loss of biodiversity, and climate change (Roberts 2012). The three case-studies also demonstrate that, whilst it may be the case that 'IUU fishing' applies to activities for which a deficit of reliable knowledge exists, there is a direct link between surveillance and monitoring of fisheries and the documented existence of illegal fishing practises. This, in turn, highlights an important observation that historians have made about state claims over ocean space and marine resources, namely, that an 'Exclusive Economic Zone and related fisheries management will only be as good as the mechanisms to ban illegal fishing inside the zone' (Heidbrink

2008). The need to enforce territorial claims and associated laws are in fact long-standing challenges, underpinning the concept of a 3-mile territorial sea, which, measured by the range of a cannon shot, extended only so far as a state was able to project its power from shore. Labelling IUU fishing as 'Fish Piracy' (i.e. OECD 2004, 2005) is perhaps appropriate, casting as it does a contemporary problem within the traditions of piracy, poaching and smuggling that rank amongst the oldest forms of maritime activity.

As well as historical perspective, the historian can also contribute a valuable methodology to the study of IUU fishing. In the first instance, the historians' approach to the interpretation of evidence is an essential tool for understanding what has taken place in the world's oceans, as has been demonstrated by the History of Marine Animal Populations (HMAP) initiative (Holm et al. 2010). IUU fishing provides a stark example of the difference between data and sources in relation to the evidence produced by fishers. What a scientist will utilise as hard data to model harvest levels and population abundance will, to the historian, present a challenge of veracity and verification; something very much akin to historical source-criticism helped to identify the 'market anomalies' and in turn expose systematic Japanese under-reporting of Southern Bluefin Tuna catches, and indeed, of other high-value tuna species as well (Ellis 2008). A second example comes from the historical imperative of explaining the human factors that ultimately influence patterns of marine resource exploitation (Holm et al. 2010). IUU fishing demonstrates the influence that economic, social, cultural, political and legal factors can have on the location, intensity and target-species of fishing activity, and it exemplifies, as in the case of Indonesian fishing in the AFZ, that there is often a complex interaction of these factors driving fishing activity in specific temporal and spatial contexts. The historian is trained to critically evaluate such factors, finding causes and patterns that can be observed unfolding across time but which may not always be readily apparent to observers unfamiliar with the concepts and approaches of the historical discipline.

Finally, studies of IUU fishing are valuable in building a truly global picture of historical change in the marine environment. Here as well, the case studies explored in this chapter allude to the importance of comparative studies of marine tenure systems and historic conceptions of the 'right to fish', of the importance of considering market-based evidence from some of the world's largest consumers of fish, and of drawing attention to the global spread of modern fishing technologies and the consequent expansion of industrial fishing effort to the most remote seas. A truly global picture of the transformation that has taken place in human exploitation of marine living resources during modern times must by necessity embrace all fishing industries, from artisanal to industrial, reach even into the most remote of the Earth's seas, and cover all kinds of fishing activity, legal and reported or otherwise. The marine environmental historian confronts the constant challenge of pushing out the boundaries of knowledge, recovering insights from past human-environment interactions that remain, for the most part, beyond the realms of what is 'knowable' (Holm et al. 2010). IUU fishing will always be one of the more 'unknowable' types of fishing activity. Yet sufficient potential for such studies exist, and the rewards are

too great to allow this opportunity to be neglected. The geographical and socio-economic dimensions of IUU fishing help to focus attention on comparatively poorly-studied fishing industries of Africa and Asia or the more remote waters of the Indian, Pacific and Southern Oceans, all of which tend to have been neglected during the rapid development of marine environmental history over the past decade and a half (Christensen 2014; Holm 2014). The potential insights that can be gained from investigating IUU fisheries can contribute to broader understandings of the transformation of marine capture fisheries in the second half of the twentieth century, to the larger goal of the socially-just division of property rights amongst all users of marine resources, and to wider understandings of the past impact of human harvesting activity and the setting of historically-accurate recovery targets for heavily exploited species and ecosystems. To all these objectives, the historian has a vital contribution to offer.

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