

## ARTICLE

# *Legal Approaches to Shark Conservation and Management across the Indo-Pacific Small Island States*

Erika Techera\* 

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### Abstract

Considerable global attention has focused on the plight of sharks and the implications for ocean health. Scientists point to the importance of sharks for healthy ecosystems and the consequences of their disproportionate removal; yet legal and management responses vary considerably. In some states, negative human-shark interactions have led to shark culls and swimming bans, and have prompted public fears about future activities that might attract species closer to coasts and communities. In other countries, sharks are respected, conserved and utilized only as a non-consumptive marine-based tourism resource. This article argues that culture plays an important role in the variety of legal responses to the conservation and management of sharks. By examining the development of shark sanctuaries across the Indian and Pacific Ocean island states, this analysis highlights the legal approaches taken, and the varying socio-cultural values that have influenced these responses. Understanding the role of culture will remain important as these laws mature, because it may affect implementation, compliance, and ultimately the achievement of conservation outcomes.

**Keywords:** Sharks, Environmental law, Indian Ocean, Pacific Ocean, Small island developing states (SIDS), Culture

## 1. INTRODUCTION

This article analyzes the legal measures introduced to conserve and manage sharks in the Indo-Pacific island states. The purpose of the article is twofold: firstly, to shed light on shark laws in these little-known jurisdictions; and, secondly, to examine historical and cultural diversities that have influenced legal developments and are likely to continue to do so in the future. The research is significant because these states have made a disproportionate contribution to global numbers of shark sanctuaries, and the legal responses in these island nations have not previously been analyzed

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\* The University of Western Australia Law School and Oceans Institute, Crawley, WA (Australia).  
Email: [erika.techera@uwa.edu.au](mailto:erika.techera@uwa.edu.au).

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comparatively.<sup>1</sup> Furthermore, in order to achieve conservation outcomes, greater consideration must be given to the cultural context in which laws are adopted and implemented. Although some scholars have pointed to the value of engaging with socio-cultural factors in advancing the governance of sharks in specific circumstances,<sup>2</sup> relatively little literature explores how these factors influence law. The article contributes to a growing body of literature on shark conservation and management laws, and also has broader implications for the conservation of other species, such as whales and turtles, where positive and negative socio-cultural factors have influenced and continue to impact upon regulatory effectiveness.<sup>3</sup>

Significant attention has been drawn recently to the over-exploitation of sharks, their importance for marine health, and the risks of their disproportionate removal.<sup>4</sup> This has led to the adoption of a range of legal measures at international, regional and national levels to address declines and advance shark conservation and management,<sup>5</sup> as well as growth in non-consumptive exploitation through marine-based tourism.<sup>6</sup> The majority of the domestic responses are less than ten years old, and therefore their effectiveness in increasing shark numbers cannot yet be meaningfully evaluated. Nevertheless, it is timely to explore the different ways in which states have chosen to address shark conservation and management, as a platform for evaluating the effectiveness of these laws in the future.

This article focuses on the small island developing states (SIDS) of the Indian and Pacific Oceans, which have contributed significantly to the global map of shark-based conservation and management measures. Worldwide, 17 states and territories have declared shark sanctuaries across their entire exclusive economic zones (EEZs), and of these nine are Indian and Pacific Ocean states or dependent territories.<sup>7</sup> Beyond

<sup>1</sup> Some work has been undertaken on the regulation of shark sanctuaries: C. Ward-Paige & B. Worm, 'Global Evaluation of Shark Sanctuaries' (2017) 47 *Global Environmental Change*, pp. 174–89; and the United Nations (UN) Food and Agriculture Organization (FAO) has analyzed implementation of the International Plan of Action for Sharks in the top shark-fishing nations: J. Fischer et al., *Review of the Implementation of the International Plan of Action for the Conservation and Management of Sharks* (FAO Fisheries and Aquaculture Circular No. 1076, 2012).

<sup>2</sup> In relation to shark hazard and mitigation policies, see, e.g., L. Gibbs & A. Warren, 'Transforming Shark Hazard Policy: Learning from Ocean-Users and Shark Encounter in Western Australia' (2015) 58 *Marine Policy*, pp. 116–24.

<sup>3</sup> F. Humber et al., 'Endangered, Essential and Exploited: How Extant Laws are not Enough to Protect Marine Megafauna in Madagascar' (2015) 60 *Marine Policy*, pp. 70–83.

<sup>4</sup> J.D. Stevens et al., 'The Effects of Fishing on Sharks, Rays, and Chimaeras (Chondrichthyans), and the Implications for Marine Ecosystems' (2000) 57 *ICES Journal of Marine Science*, pp. 476–94; R.A. Myers & B. Worm, 'Rapid Worldwide Depletion of Predatory Fish Communities' (2003) 423(6937) *Nature*, pp. 280–3; R.A. Myers et al., 'Cascading Effects of the Loss of Apex Predatory Sharks from a Coastal Ocean' (2007) 315(5820) *Science*, pp. 1846–50; N.K. Dulvy et al., 'You Can Swim but You Can't Hide: The Global Status and Conservation of Oceanic Pelagic Sharks and Rays' (2008) 18(5) *Aquatic Conservation*, pp. 459–82.

<sup>5</sup> E.J. Techera & N. Klein, 'Fragmented Governance: Reconciling Legal Strategies for Shark Conservation and Management' (2011) 35(1) *Marine Policy*, pp. 73–8; C.A. Ward-Paige, 'A Global Overview of Shark Sanctuary Regulations and their Impact on Shark Fisheries' (2017) 82 *Marine Policy*, pp. 87–97.

<sup>6</sup> K. Richards et al., 'Sharks and People: Insight into the Global Practices of Tourism Operators and their Attitudes to Shark Behaviour' (2015) 91(1) *Marine Pollution Bulletin*, pp. 200–10.

<sup>7</sup> The 17 include (with Indo-Pacific states in italics): Bahamas, British Virgin Islands, Caribbean Netherlands, Cayman Islands, *Cook Islands*, Curacao, *French Polynesia*, Grenada, Honduras,

the high profile ‘shark parks’, the majority of these states restrict fishing, have banned finning or have adopted other protection measures for sharks. Therefore, despite their small size and limited resources, these states have shown significant commitment to shark conservation.

On closer inspection, it is clear that, with few exceptions, the measures taken differ considerably in scope and coverage. The variety of responses is linked partly to the diverse legal systems, economic interests, political will, and public pressure to better manage sharks in national waters.<sup>8</sup> Nevertheless, the various legal tools and the ways in which they are used have also been influenced by history, culture, and human safety concerns, resulting in differing values being placed upon sharks.

Where world views and conservation goals align, synergistic benefits can be achieved; but where culture and conservation clash, negative conservation outcomes often result. In the case of sharks, cultural traditions associated with eating shark fin soup, for example, have been shown to have strongly influenced the prevalence of shark finning.<sup>9</sup> The influence of culture and tradition on shark populations has been demonstrated in other island jurisdictions such as Indonesia. On the one hand, where customary law forbids the killing of whale sharks, this has led to ‘a low level of harvesting of whale sharks in the region’.<sup>10</sup> On the other hand, in other parts of Indonesia such as Nusa Tenggara Timur, subsistence-based marine megafauna fishing took place where no such customary beliefs specific to whale sharks existed.<sup>11</sup> As new issues emerge that require legal action, the various socio-cultural attitudes towards sharks potentially drive differing responses. In the context of the Indo-Pacific islands, legal responses to date and current issues concerning human safety provide an illuminating lens through which to explore these matters to support the inference that socio-cultural factors play a critical role in the good governance of sharks.

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*Kiribati, Maldives, Marshall Islands, the Federated States of Micronesia (FSM), New Caledonia, Palau, St Maarten, and Tokelau.* Only the independent island states are explored in this article and not the French, United States (US), or New Zealand external territories.

- <sup>8</sup> Gibbs & Warren, n. 2 above. Many of these states have shark-based tourism activities, yet Ward-Paige found that dive tourism was not a strong common thread among the countries that had established shark sanctuaries, and therefore different reasons must exist in each jurisdiction: Ward-Paige, n. 5 above.
- <sup>9</sup> A. Dell’Apa, M.C. Smith & M.Y. Kaneshiro-Pineiro, ‘The Influence of Culture on the International Management of Shark Finning’ (2014) 54(2) *Environmental Management*, pp. 151–61; M. Fabinyi, ‘Historical, Cultural and Social Perspectives on Luxury Seafood Consumption in China’ (2011) 39(1) *Environmental Conservation*, pp. 83–92. Despite evidence of the negative effects of eating sharks, these cultural beliefs persist, including those related to health benefits: C. Jefferies, ‘Sharks and the Culinary Clash of Culture and Conservation: Why Are We Not Considering the Health Consequences of Shark Consumption?’ (2012) 20(3) *Health Law Review*, pp. 33–9.
- <sup>10</sup> ‘[C]ulturally driven prohibitions and customary beliefs concerning whale sharks among Bajo fishermen’ are found in Timor and Roti Islands, including ‘specialised customary practices concerning whale sharks’: N.E. Stacey et al., ‘Prospects for Whale Shark Conservation in Eastern Indonesia through Bajo Traditional Ecological Knowledge and Community-based Monitoring’ (2012) 10(1) *Conservation and Society*, pp. 63–75. These observations are not limited to sharks: R.H. Leeney & P. Poncelet, ‘Using Fishers’ Ecological Knowledge to Assess the Status and Cultural Importance of Sawfish in Guinea-Bissau’ (2015) 25 *Aquatic Conservation: Marine and Freshwater Ecosystems*, pp. 411–30.
- <sup>11</sup> Stacey et al., *ibid.*, pp. 64, 68. See also S. Hasibuan, ‘Tanjung Luar: A Village Renowned for Shark Trading’, *Aljazeera*, 29 Mar. 2018, available at: <https://www.aljazeera.com/indepth/inpictures/tanjung-luar-village-renowned-shark-trading-180329071924008.html>.

The article commences by exploring the history and culture of the Indo-Pacific island states, highlighting diversities and commonalities. The article then examines the legal responses to global concerns about the conservation status of sharks, before analyzing in detail the 17 states (12 in the Pacific and 5 in the Indian Ocean) that have specific shark conservation and management laws. Concerns about tourism, human safety and aquaculture are also explored in the wake of shark attacks and proposed land-use and ocean-based developments. Emerging trends and patterns are then highlighted to support the inference that history and culture have shaped legal responses and may influence implementation, compliance and enforcement in the future. If the Indo-Pacific island shark laws can be made effective over time, then they will become of global significance, given the size of the maritime zones involved. This research is therefore significant because it examines shark laws in a range of poorly researched jurisdictions, and illuminates cultural differences that have influenced legal developments to date and may affect their future success or failure.

## 2. HISTORY AND CULTURE

This article explores the law in independent island states of the Indo-Pacific region. The Indian Ocean island states considered here include Mauritius, the Seychelles and the Maldives, which are small island developing states (SIDS), as well as Madagascar, which is a least developed country (LDC), and Sri Lanka, a developing country.<sup>12</sup> The Pacific SIDS explored here include the Cook Islands, the Federated States of Micronesia (FSM), Fiji, Kiribati, the Marshall Islands, Nauru, Palau, Papua New Guinea, Samoa, the Solomon Islands, Tonga, and Vanuatu.<sup>13</sup>

Although both the Indian and the Pacific Oceans are home to SIDS and LDCs, the cultural origins of the inhabitants and patterns of settlement differ markedly. In the Pacific Islands three main groups of people – Polynesian, Micronesian, and Melanesian – came to the region from the Asian continent, and over time have intermingled. Patterns of settlement extend from west to east, beginning with Micronesian and Melanesian peoples and ending with Polynesian settlement. FSM, Papua New Guinea, and the Solomon Islands were populated over 30,000 years ago, Vanuatu in 1300 BC, Fiji in around 1500 BC, and states such as Kiribati and Tonga less than a thousand years ago. The legal systems in place today are largely common law-based with widespread recognition of the customary law of the indigenous peoples.

There are few islands in the Indian Ocean with indigenous peoples. The majority of populations are descended from African, Asian, Arabic, and European settlers, slaves and indentured labourers. Sri Lanka was settled early – around 35,000 years ago – and the Maldives over 2,000 years ago, but these are exceptions in the region. Madagascar was settled by African peoples around 500 AD, and later by Asian and

<sup>12</sup> Reunion Island is also referred to below, yet it is not an independent state but rather a French external territory.

<sup>13</sup> Other Pacific SIDS include Nauru, Niue, and Tuvalu. There are several other non-independent Pacific islands: French (New Caledonia and French Polynesia), US (Commonwealth of the Northern Mariana Islands, Guam, and American Samoa), and New Zealand (Tokelau) external territories.

other groups. Mauritius and the Seychelles, for example, were unpopulated before traders and travellers first settled there in the 17<sup>th</sup> and 18<sup>th</sup> centuries respectively, and their populations today are descended largely from African slaves or Indian indentured labourers brought to the islands to work on colonial plantations, together with other settlers and workers from Europe, China, and the Middle East.<sup>14</sup> This history has shaped the cultural fabric of the societies that exist today. The legal systems in Mauritius and the Seychelles are a fusion of common law and civil law derived from earlier periods of French and British rule. Malagasy law is based on the French civil law system but customary law is also recognized.<sup>15</sup> The legal system in the Maldives is based upon Sharia law with some British common law influences. The legal system in Sri Lanka has a Dutch-Roman origin.

The significance of this background, for the purposes of this article, relates to the varied history of human-shark relationships across the Indo-Pacific. In many Pacific cultures, sharks were respected and believed to have spiritual powers.<sup>16</sup> Various parts of the shark were used – meat and liver for food, skin for drums, teeth for cutting implements – but these uses had meanings and sometimes sharks were even revered as gods.<sup>17</sup> In Kiribati sharks feature in settlement mythology, initiation ceremonies and traditional weapons, but they were also fished.<sup>18</sup> In Papua New Guinea sharks were believed to embody ancestors.<sup>19</sup> So seriously were these beliefs taken that wars were fought when disrespect was shown to the totem sharks of rival tribes in the Marshall Islands.<sup>20</sup> This cultural respect did not ensure that sharks remained unharmed, as they were often the subject of ritual killings and eaten in the belief that this would provide the consumer with the sharks' powers.<sup>21</sup> The extent of fishing is demonstrated by the historical number of different types of shark hook that have been documented, as well as traditional fishing practices such as shark calling.<sup>22</sup> More recently, the Cook Islands and Fiji, for example, have had large-scale targeted shark fisheries.<sup>23</sup>

In the Indian Ocean there is little evidence of sharks having acquired elevated status or particular cultural significance. There is a strong history of shark fishing with a focus upon economic gain rather than cultural values. Shark-based fishing in the Maldives

<sup>14</sup> The population is therefore of Indian or Afro-Malagasy descent (Creole).

<sup>15</sup> K. Cuskelly, *Customs and Constitutions: State Recognition of Customary Law around the World* (International Union for Conservation of Nature (IUCN), 2011).

<sup>16</sup> D. Crawford, *Shark* (Reaktion Books, 2008).

<sup>17</sup> Most notably in Hawaii where there were nine shark gods (*aumakua*): Crawford, *ibid.* Sharks were also revered in other parts of the Pacific: in Fiji as *Dakuwaqa*, in the Polynesian islands as *Kaubuhu*, and in French Polynesia as *Taputapua*: E.J. Techera, 'Fishing, Finning and Tourism: Trends in Pacific Shark Conservation and Management' (2012) 27(3) *International Journal of Marine and Coastal Law*, pp. 1–25. See also Dell'Apa, Smith & Kaneshiro-Pineiro, n. 9 above. For other uses see D. Owen, *Shark: In Peril in the Sea* (Allen and Unwin, 2009).

<sup>18</sup> J. Drew, C. Philipp & M.W. Westneat, 'Shark Tooth Weapons from the 19<sup>th</sup> Century Reflect Shifting Baselines in Central Pacific Predator Assemblies' (2013) 8(4) *PLOS One*, pp. 1–7.

<sup>19</sup> Crawford, n. 16 above, p. 53.

<sup>20</sup> *Ibid.*, p. 52.

<sup>21</sup> Owen, n. 17 above, pp. 39–44.

<sup>22</sup> *Ibid.*, pp. 30–2.

<sup>23</sup> See Marine Resources Act 2005 – Marine Resources (Longline Fishery) Regulations 2008.

allegedly dates back millennia as sharks were targeted for their livers from which oil was used to treat wooden boat hulls.<sup>24</sup> Although no whale shark fishery has developed in the Seychelles, a shark fishing industry started in 1898 ‘when the trade in dried and salted shark meat to East Africa and Asia began, and shark vertebrae were fashioned into ornamental walking sticks for the tourist trade’.<sup>25</sup> Demand for shark meat rose in the early 1950s, leading to noticeable declines in stocks by the end of the decade, shortly after which targeted fishing ceased.<sup>26</sup> This culture of shark fishing meant that when the market value of shark fin rose in the 1990s, a targeted fishery emerged again. As conservation concerns were raised, the Seychelles government moved to ban all gill net fishing for sharks in 1998, and in 2006 banned shark finning by foreign fishing vessels.<sup>27</sup> Similar regulatory patterns are seen in other jurisdictions where laws were strengthened as shark numbers declined.<sup>28</sup> In Madagascar sharks appear to have had no traditional cultural importance, and shark fishing has been conducted by traditional and artisanal fishers for some time with a steady incline in catches since the 1980s.<sup>29</sup> The traditional small-scale fishery in the Maldives has changed over time, with increasing industrialization and the opening up of overseas markets for shark fins, meat, and livers.<sup>30</sup> As will be seen below, since the 1990s a more conservation-focused approach has been taken.

Increasing catches, industrialization and global demand have led to declines in the number of sharks, and in turn triggered the introduction of the first forms of legal protection; yet, the laws adopted have taken different forms. The cultural background, customs and traditions of Indo-Pacific peoples differ markedly and, it is argued, remain influential in the conservation and utilization of sharks, including legal responses. The next two sections analyze the conservation and fishery-related laws that have been adopted across the jurisdictions to establish shark sanctuaries, and then explore more recent legal measures related to human safety, tourism and aquaculture.

### 3. LEGAL RESPONSES TO SHARK CONSERVATION AND MANAGEMENT

The section below explores the engagement of the Indo-Pacific states with relevant international laws before identifying the national legal measures that have been adopted for the conservation and management of sharks, which are of particular importance given the extent of the marine areas covered.

<sup>24</sup> H. Sinan, M.S. Adam & R.C. Anderson, ‘Status of Shark Fisheries in the Maldives’, IOTC–2011–WPEB07–56, available at: <http://www.iotc.org/sites/default/files/documents/proceedings/2011/wpeb/IOTC-2011-WPEB07-56.pdf>.

<sup>25</sup> T.P. Peschak, *Lost World: The Marine Realm of the Seychelles* (Save Our Seas, South Africa, 2009), p. 128.

<sup>26</sup> *Ibid.*

<sup>27</sup> *Ibid.*, p. 129.

<sup>28</sup> As will be seen, this is a common pattern in other Indo-Pacific states. The experience is not limited to this region and has been noted, e.g., in Ecuador: Dell’Apa, Smith & Kaneshiro-Pineiro, n. 9 above, p. 157.

<sup>29</sup> Humber et al., n. 3 above, p. 71.

<sup>30</sup> Sinan, Adam & Anderson, n. 24 above.

### 3.1. Indo-Pacific Island Engagement with International Law

At the international level, attention was first drawn to the plight of sharks in the 1970s. Since then, a number of international law instruments have adopted a rich range of measures both to conserve and sustainably harvest sharks. These instruments have been explored in detail in other publications and therefore a summary only is set out below.<sup>31</sup>

The first binding international law measures were adopted under the 1973 Convention on International Trade in Endangered Species (CITES).<sup>32</sup> As the name implies, this treaty regulates cross-border trade of species with such a poor conservation status that a two-thirds majority of member states have agreed to list them in one of three Appendices. Appendix I prohibits international trade in listed species unless there are exceptional circumstances. Species in Appendix II may be traded subject to import and export permits. Any state may list a species in Appendix III to alert other states about conservation concerns, and catalyze voluntary trade control agreements. The great white shark (*Carcharodon carcharias*) was listed under CITES Appendix III in 2000 and upgraded to Appendix II in 2005. Meanwhile, the whale shark (*Rhincodon typus*), and basking shark (*Cetorhinus maximus*) (two docile filter feeding animals) were listed in Appendix II in 2003; three species of hammerhead (*Sphyrna lewini*, *Sphyrna mokarran* and *Sphyrna zygaena*), porbeagle (*Lamna nasus*) and oceanic white tip (*Carcharhinus longimanus*) sharks were listed in 2014; and, most recently, the thresher (*Alopias spp.*) and silky shark (*Carcharhinus falciformis*) in 2017.<sup>33</sup> These provisions seek to regulate, rather than prohibit, international trade in listed species. Importantly, trade is defined in CITES as including import, export, re-export, and 'introduction from the sea'. The inclusion of this latter phrase means that the transportation of species caught on the high seas, in areas beyond national jurisdiction, is also covered.

Alongside CITES, the Convention on Migratory Species of Wild Animals (CMS)<sup>34</sup> provides a listing mechanism for those species endangered throughout all or a significant proportion of their range. Species listed in Appendix I cannot be taken, while an Appendix II listing means that range states must enter into an agreement for their benefit. Appendix I listings under CMS include the whale shark in 1999, great white shark in 2002, and basking shark in 2005. Appendix II listings include mako sharks (*Isurus oxyrinchus*, *Isurus paucus*), and porbeagle (*Lamna nasus*) in 2008, and hammerhead (*Sphyrna lewini*, *Sphyrna mokarran*), silky sharks (*Carcharhinus falciformis*), and thresher sharks (*Alopias pelagicus*, *Alopias superciliosus*, *Alopias vulpinus*) in 2014. A Memorandum of Understanding has also been adopted to encourage

<sup>31</sup> For a detailed consideration of the international laws, see E.J. Techera & N. Klein, *International Law of Sharks: Options, Opportunities and Obstacles* (Brill, 2017). For a further analysis of gaps and challenges in the global regime, see Techera & Klein, n. 5 above.

<sup>32</sup> Washington, DC (US), 3 Mar. 1973, in force 1 July 1975, available at: <https://www.cites.org/eng/disc/text.php>.

<sup>33</sup> CITES, 'History of CITES Listing of Sharks', available at: <https://cites.org/eng/prog/shark/history.php>.

<sup>34</sup> Bonn (Germany), 23 June 1979, in force 1 Nov. 1983, available at: <http://www.cms.int/en/convention-text>.

cooperation, the development of plans and other measures to conserve and manage migratory sharks.<sup>35</sup> These two treaties have been widely adopted (see [Table 1](#)). Both conventions are focused on conservation, and other international law instruments have addressed the utilization of sharks and fishing.

The United Nations (UN) Food and Agriculture Organization (FAO) adopted the International Plan of Action for the Conservation and Management of Sharks (FAO IPOA Sharks) in 1999.<sup>36</sup> It covers all shark species and both protection and utilization, but it is a soft law instrument only. It sets out principles, objectives, and implementation procedures to achieve effective conservation and management of sharks, as well as including suggested contents for national measures and assessment reports.<sup>37</sup> It relies on member states developing National Plans of Action (NPOAs); a number of Indo-Pacific countries have now done so ([Table 1](#)).<sup>38</sup> Although all Indo-Pacific states studied here have signed the FAO IPOA Sharks, greater concern for and focus on sharks can be seen in the Pacific, illustrated by the adoption of the Regional Plan of Action (RPOA).<sup>39</sup>

Regional Fishery Management Organizations (RFMOs) also have a role to play in shark conservation. RFMOs set quotas, catch allocations and, of relevance, conservation management measures for areas and species within their mandate, including areas beyond national jurisdiction. Member states comprise littoral countries and those nations fishing in regional waters. No single international law has yet emerged to prohibit shark finning, but the RFMO measures do impose some restrictions with regard to certain species.<sup>40</sup> Of relevance to this article are the Indian Ocean Tuna Commission (IOTC), which has adopted specific measures for oceanic whitetip and thresher sharks, as well as more general reporting and release of bycatch obligations,<sup>41</sup> and the Western Central Pacific Fisheries Commission (WCPFC), which in addition has adopted measures for silky, blue, short fin mako, and whale sharks.<sup>42</sup>

Although not legally binding, the UN General Assembly (UNGA) Sustainable Fisheries Resolutions further demonstrate international concern for shark conservation and management, and recognize their cultural and biological importance as well as

<sup>35</sup> CMS Convention Secretariat, Memorandum of Understanding (MoU) on the Conservation of Migratory Sharks, Monaco, Dec. 2018, available at: <https://www.cms.int/sharks/en/page/sharks-mou-text>.

<sup>36</sup> Adopted by the FAO Committee on Fisheries (COFI) in 1999 and endorsed by the FAO Council in 2000, available at: <http://www.fao.org/ipoa-sharks/background/about-ipoa-sharks/en>.

<sup>37</sup> For further detail see Techera & Klein, n. 31 above, pp. 32–5; see also Techera & Klein, n. 5 above.

<sup>38</sup> See FAO, ‘Database of Measures on Conservation and Management of Sharks’, available at: <http://www.fao.org/ipoa-sharks/database-of-measures/en>.

<sup>39</sup> M. Lack & F. Meere, ‘Pacific Islands Regional Plan of Action for Sharks: Guidance for Pacific Island Countries and Territories on the Conservation and Management of Sharks’, SPC/FFA/SPREP, Oct. 2009, available at: <http://www.fao.org/3/a-br378e.pdf>.

<sup>40</sup> These have been usefully summarized at CITES, ‘Regional Fisheries Management Organization Measures for Shark Conservation and Management’, Mar. 2014, available at: <https://cites.org/sites/default/files/eng/prog/shark/docs/shark%20RFMO%20measures%20-%20draft%20March%202014.pdf>.

<sup>41</sup> Indian Ocean Tuna Commission, ‘Conservation and Management Measures’, available at: <http://www.iotc.org/cmms>.

<sup>42</sup> Western Central Pacific Fisheries Commission, ‘Sharks’, 22 July 2017, available at: <https://www.wcpfc.int/sharks>. See also FAO, ‘International Plan of Action for Conservation and Management of Sharks: Regional Shark Measures’, available at: <http://www.fao.org/ipoa-sharks/regional-sharks-measures/en>.



**Table 1** International Instruments and Member States

State	CITES	CMS	CMS MoU Sharks	FAO-IPOA Sharks	Port State Measures Agreement
<b>PACIFIC ISLANDS</b>					
Cook Islands		✓		✓ RPOA	
Federated States of Micronesia (FSM)				✓ RPOA	
Fiji	✓	✓	✓	✓ RPOA	
Kiribati				✓ RPOA	
Marshall Islands				✓ RPOA	
Nauru				✓ RPOA	
Palau	✓	✓		✓ RPOA	✓
Papua New Guinea	✓			✓ RPOA	
Samoa	✓	✓		✓ RPOA	✓
Solomon Islands	✓			✓ RPOA	
Tonga	✓			✓ NPOA+RPOA	✓
Vanuatu	✓		✓	✓ NPOA+RPOA	✓
<b>INDIAN OCEAN ISLANDS</b>					
Madagascar	✓	✓	✓		✓
Maldives	✓			✓ NPOA	✓
Mauritius	✓	✓		✓ NPOA	✓
Seychelles	✓	✓		✓ NPOA	✓
Sri Lanka	✓	✓	✓	✓ NPOA	✓

their vulnerability.<sup>43</sup> Reference is made to the FAO IPOA Sharks, which Indo-Pacific states have endorsed, with calls for more states to adopt measures to implement it. Furthermore, the UNGA Resolutions urge further action, which includes data collection at national and regional levels, and compliance with RFMO conservation management measures. The National Plans of Action adopted by the Indo-Pacific island states (see Table 1) respond directly to the FAO IPOA and the UNGA Resolutions, given their form and structure. Domestic shark laws, however, appear to have been influenced by a range of factors, including other international laws.

Indo-Pacific states are important coastal nations in whose waters sharks may be fished or conserved, and sometimes they are the flag states for vessels fishing in these areas. Importantly, they also function as port states where sharks or their parts may be landed. Given the difficulties of monitoring vast ocean areas, port states can play an important role in inspecting catches and enforcing laws for shark conservation and management. The FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing is aimed at addressing illegal

<sup>43</sup> See, e.g., UNGA Resolution 66/68, Sustainable Fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 Dec. 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and Related Instruments (6 Dec. 2011), UN Doc. A/RES/66/68, available at: [http://www.un.org/en/ga/search/view\\_doc.asp?symbol=%20A/RES/66/68](http://www.un.org/en/ga/search/view_doc.asp?symbol=%20A/RES/66/68).

fishing, including for sharks and shark fins, and strengthens existing laws that allow a port state to refuse entry to a vessel suspected of engaging in illegal, unreported or unregulated fishing.<sup>44</sup> As set out in [Table 1](#), all of the Indian Ocean states explored here have ratified this Convention, as well as some of the Pacific island nations.

The above overview demonstrates that, at the international level, both species-based and trade-based measures have been adopted specifically for sharks. In addition to these legal tools, the Convention on Biological Diversity (CBD)<sup>45</sup> has adopted area-based approaches, setting the target of 10% of ocean areas to be set aside as marine protected areas (MPAs) by 2020.<sup>46</sup> Although the CBD does not mention sharks, as of May 2018, 7.26% of marine areas globally are under some form of protection,<sup>47</sup> and almost half of these areas (3% of the world's oceans) are protected as shark sanctuaries.<sup>48</sup> The inclusion of shark sanctuaries in global updates on MPA targets directly links these conservation measures to international biodiversity laws. Yet, it is not clear that this was the trigger for national shark conservation and management laws. As will be seen below, the majority of the domestic laws utilized to establish shark sanctuaries are fisheries regulations. This points strongly to the influence of the FAO IPOA Sharks, as well as responding to the reality that fishing has the greatest impact on these species.

### *3.2. Domestic Law for the Conservation and Utilization of Sharks*

A considerable number of states have now adopted measures to protect sharks, which include both species-based measures and area-based measures (see [Table 2](#)). Much media attention has been given to the declaration of 'shark sanctuaries', usually covering the entire EEZ of any given country. Sixteen states and territories worldwide have now adopted such an approach,<sup>49</sup> of which eight are in the Indo-Pacific region: the states examined here include the Cook Islands, the FSM, Kiribati, the Maldives, the Marshall Islands, Palau, and Samoa. Despite the reference to a 'sanctuary', the specific legal provisions rarely utilize protected area management laws, and indeed many of the protection measures are included in fishery regulations. Furthermore, the specific conservation and management measures vary considerably in terms of the breadth of coverage of species and activities, as well as offences and penalties. In part this may be explained by the differing legal systems operating in each country and the existing legal frameworks available for inclusion of shark-based provisions. This article argues, however, that the underlying cultural beliefs and attitudes towards sharks are also at play. The sections that follow explore the domestic legal provisions in detail.

Most of the Indo-Pacific SIDS are parties to CITES (as noted above) and therefore have protection measures in place to implement those specific obligations, adopted in

<sup>44</sup> Rome (Italy), 22 Nov. 2009, in force 5 June 2016, available at: <http://www.fao.org/port-state-measures>. See also Techera & Klein, n. 31 above, pp. 190–3.

<sup>45</sup> Rio de Janeiro (Brazil), 5 June 1992, in force 29 Dec. 1993, available at: <http://www.cbd.int/convention>.

<sup>46</sup> CBD Secretariat, 'Aichi Biodiversity Targets', available at: <https://www.cbd.int/sp/targets>.

<sup>47</sup> Protected Planet, 'Protected Areas Coverage in 2018', available at: <https://www.protectedplanet.net/marine>.

<sup>48</sup> Ward-Paige, n. 5 above.

<sup>49</sup> See Ward-Paige & Worm, n. 1 above.

Table 2 National Laws referring to Sharks

State	Legislation	Type of Legal Measure
PACIFIC ISLANDS		
Cook Islands	Marine Resources Act 2005	Regulation of fisheries
	Marine Resources (Shark Conservation) Regulations 2012	Broad provisions prohibiting targeted fishing, possession, trade and use of certain equipment
	Marine Resources (Large Pelagic Longline Fishery and Quota Management System) Regulations 2016	
Federated States of Micronesia (FSM)	Title 24 of the Code of the Federal States of Micronesia on Marine Resources	Regulation of fisheries and fishing
	Public Law 18-108 (2014)	Shark finning, possession and evidence
	Public Law 19-21 (2015)	
	Public Law 19-36 (2015)	
Fiji	Endangered and Protected Species Act 2002	Conservation law
	Endangered and Protected Species (Amendment) Act 2017 (No. 10 of 2017)	Conservation law
	Fisheries Act (Cap. 158)	Fisheries regulation
	Fisheries (Shark Reef Marine Reserve) (Serua) Regulations 2014 (2014)	Protected area law
	Offshore Fisheries Management Decree 2012	Fisheries regulation
	Offshore Fisheries Management Regulations 2014 (L.N. No. 18 of 2014)	Offshore fishing gear restriction and RFMO rules
Kiribati	Fisheries Act 2010	Fisheries regulation
	Shark Sanctuary Regulations 2015	Protected area law restricting fishing and possession of sharks
Marshall Islands	Fisheries Act 1997 (51 MIRC Ch. 2)	Fishing regulation
	Title 51 (Fisheries) Amendment Act 2011 (Public Law No. 2011 - 63)	Fishing, possession and finning restrictions
Nauru	Fisheries Act 1997 – Fisheries (PNA Third Implementing Arrangement) Regulations 2009	Fisheries regulation
	Fisheries (PNA Third Implementing Arrangement) (Amendment) Regulations 2010	Restriction on setting nets
Palau	Title 27 of the Palau National Code on Fishery Zones and Regulation of Foreign Fishing	Protected area law
	Amendment to Title 27 of Palau National Code, Division 1, Chapter 1 (RPPL No. 6-36)	Sanctuary and prohibition on fishing and use of certain gear and equipment
	Shark Haven Act 2009	
	Palau National Marine Sanctuary Act 2015	

*(Continued)*

**Table 2** National Laws referring to Sharks (Continued)

State	Legislation	Type of Legal Measure
<b>PACIFIC ISLANDS</b>		
Papua New Guinea	International Trade (Fauna and Flora) Act 2003	Trade law
	Customs Act	Customs duties law
	Customs Tariff (2011 Budget) (Amendment) Act 2010	Fees and duties for import and export of shark products
Samoa	Lands, Surveys and Environment Act 1989	Conservation law
	Marine Wildlife Protection Regulations 2009	Prohibitions on commercial fishing for sharks
Solomon Islands	Fisheries Act 1998	Fishing regulation
	Fisheries (PNA Third Implementation Arrangement) Regulations 2012	Restriction on setting of purse seine nets
	Fisheries (Fees) (Amendment) Regulations 2013 (2013)	
Tonga	Fisheries Management Act 2002	Fisheries law
	Fisheries Management (Processing and Export) Regulations 2008	Import and export duties
	Customs Act 2007	Duties legislation
	Customs Duty (Amendment) (No. 3) Order 2013	Imposition of duty on sharks
Vanuatu	International Trade (Fauna and Flora) Act 1991	Trade law
<b>INDIAN OCEAN ISLANDS</b>		
Madagascar	Law 96-025	Environmental law
	Antongil Bay LMMA	Marine protected area
Maldives	Fisheries Law of the Maldives 1987 (Law No. 5/87)	Fisheries law
	General Fisheries Regulations (amended by 30-D2/29/2010/32)	Shark fishing prohibitions
Mauritius	Fisheries and Marine Resources Act 2007	Fisheries law
	Fisheries and Marine Resources (Import of Fish and Fish Products) Regulations 2012 (GN No. 27 of 2012)	Landing of shark fins
	Fisheries and Marine Resources (Import of Fish and Fish Products) (Amendment) Regulations 2016 (GN No. 34 of 2016)	Environmental legislation
	Local Government Act 2011	
	District Council of Savanne (Markets) Regulations 2014 (G.N. No. 83 of 2014)	Sale of shark products
	Wildlife and National Parks Act 1993 – Wildlife Regulation 1998	Conservation law
	Wildlife (Amendment) Regulations 2013	Trade restrictions

(Continued)

**Table 2** National Laws referring to Sharks (Continued)

INDIAN OCEAN ISLANDS		
Seychelles	Wild Animals and Birds Protection Act 1961	Conservation law
	Wild Animals (Whales Shark) Protection Regulation (Cap. 247)	Protection of whale sharks in all waters
	Fisheries Act (No. 20 of 2014)	Fishing regulation
	Fisheries (Shark Finning) Regulations, 2006 (S.I. No. 7 of 2006)	Regulating shark finning
	Public Health Act 1960	Environmental legislation
	Public Health (Market) Regulations (Cap. 189)	Sale of shark products
	Export of Fishery Products Act 1996	Export regulations
	Export of Fishery (Sanitary) Regulations 2010	Restrictions on heavy metals
Sri Lanka	Fisheries and Aquatic Resources Act 1996	Fisheries law
	High Sea Fishing Operations Regulations 2014	Shark finning
	Shark Fisheries Management Regulations 2015	Shark finning
	Shark Fisheries Management (High Seas) Regulations 2015	Shark finning
	Fishing Gear Marking Regulations 2015	Marking of longlines
	Implementation of Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing Regulations 2015	Landing of sharks and fins

direct response to their international commitments. A variety of instruments, however, have been used: general wildlife regulations, endangered species statutes, and specific provisions focusing on international trade. In the Pacific, for example, Fiji has amended its Endangered and Protected Species Act 2002 to include a number of shark species, including the sawfish (*Pristidae spp*), tiger (*Galeocerdo cuvier*), blue (*Prionace glauca*), mako, silky, sandbar (*Carcharhinus plumbeus*), and several reef sharks (*Carcharhinus perezii*).<sup>50</sup> This amendment regulates international trade in accordance with CITES, and extends protection to domestic trade also, requiring registration of any person engaged in trade or commercial activities associated with listed species.<sup>51</sup> In Papua New Guinea the great white, whale, and basking sharks are listed under the International Trade (Fauna and Flora) Act 2003, as they are under similar legislation in Vanuatu.<sup>52</sup> Further conservation measures for specific species listed under CITES are found in wildlife laws in some jurisdictions. For example, the Seychelles, in the Indian Ocean, has formally protected whale sharks under the Wild Animals (Whales Shark) Protection Regulation 2003, which provides that the killing or taking of a whale shark anywhere in the Seychelles is prohibited. In Mauritius, the Wildlife and National Parks Act 1993 – Wildlife Regulation 1998 regulates trade in great white,

<sup>50</sup> Endangered and Protected Species (Amendment) Act 2017 (Fiji).

<sup>51</sup> Endangered and Protected Species Act 2002 (Fiji), s. 21.

<sup>52</sup> International Trade (Fauna and Flora) Act (Vanuatu).

whale, and basking sharks.<sup>53</sup> Both states also have other relevant fisheries laws, examined further below.

A notable feature of the Indo-Pacific island states is the extent to which fisheries laws have been utilized to conserve and manage sharks. In Samoa, for example, protection extends to sharks through the creation of offences under the Marine Wildlife Protection Regulations 2009, which prohibit the commercial fishing of sharks, landing shark fins without the carcass, keeping sharks caught as bycatch without authorization, or landing a shark that dies before release.<sup>54</sup> Sharks can, however, still be taken for food, bait or ‘production of a saleable product’.<sup>55</sup> Significantly, the Samoan legislation includes an exception under regulation 11(3): ‘It shall not be an offence ... if a shark is killed for the purpose of protecting human life’. However, recent announcements have been made by the Samoan Prime Minister which indicate that a shark sanctuary will be declared across its EEZ, prohibiting commercial fishing, the sale of, and trade in all sharks.<sup>56</sup>

In the majority of states, specific measures to conserve and manage sharks have been adopted under fisheries laws. All states examined here have general fisheries regulations. These include provision of a framework for the licensing of commercial fishing vessels, quotas and catch limits; restrictions on certain species or areas that may be fished; and provisions for seasonal bans. Some of these provisions have been tailored for the conservation and management of sharks. Three features of this fisheries regulation are of particular note: (i) regulation of finning; (ii) bycatch provisions; and (iii) restrictions on certain gear and equipment.

In the Cook Islands, for example, the Marine Resources (Shark Conservation) Regulations 2012 under the Marine Resources Act 2005 provides for the protection of all sharks, rays, and chimaera.<sup>57</sup> The catch, capture, target or intentional fishing of sharks is prohibited, as well as finning, mutilating, injuring, or chumming to attract sharks.<sup>58</sup> Any shark accidentally caught must be released.<sup>59</sup> Trading, selling, purchasing, bartering, receiving, possessing, transferring, storing, or trans-shipping any shark part is banned.<sup>60</sup> Wire leaders and trace wires are prohibited.<sup>61</sup> These strong provisions are matched by penalty provisions: each shark or part constitutes a separate offence, and penalties range between 100,000 and 200,000 New Zealand dollars (NZD).<sup>62</sup> Notably, sharks formerly featured as a targeted fishery under the Marine Resources

<sup>53</sup> As amended by the Wildlife (Amendment) Regulations 2013 (Mauritius).

<sup>54</sup> Marine Wildlife Protection Regulations 2009 (Samoa), reg. 11.

<sup>55</sup> *Ibid.*

<sup>56</sup> N. Matatia, ‘P.M. Declares Samoa’s Oceans Shark Sanctuary’, *Samoa Observer*, 1 Mar. 2018, available at: [http://www.samoobserver.ws/en/02\\_03\\_2018/local/30636/PM-declares-Samoa%E2%80%99s-oceans-shark-sanctuary.htm](http://www.samoobserver.ws/en/02_03_2018/local/30636/PM-declares-Samoa%E2%80%99s-oceans-shark-sanctuary.htm).

<sup>57</sup> Marine Resources (Shark Conservation) Regulations 2012 (Cook Islands), reg. 3.

<sup>58</sup> *Ibid.*, reg. 5(1).

<sup>59</sup> *Ibid.*, reg. 5(2).

<sup>60</sup> *Ibid.*, reg. 5(3) and (4).

<sup>61</sup> *Ibid.*, reg. 6.

<sup>62</sup> *Ibid.*, reg. 7.

(Longline Fishery) Regulations 2008, although finning was banned. Amendments in 2012 resulted in the adoption of the Marine Resources (Large Pelagic Longline Fishery and Quota Management System) Regulations 2016, which make it clear that sharks are no longer a target species, and also refer to WCPFC measures aimed at reducing bycatch of silky and oceanic whitetip sharks.

In the FSM, shark provisions have also been included under fisheries law: Title 24 of the Code of the Federated States of Micronesia on Marine Resources. Three separate amendments to section 913 have been made. Public Law 18-108 (2014) prohibits shark finning (including the removal of shark fins on board a vessel) and makes it illegal to knowingly capture, possess, ship, transport, import, export, or sell any member of the *elasmobranchii* family.<sup>63</sup> In addition, the provision requires sharks caught as bycatch to be released if alive, or landed whole at a trans-shipment port if dead.<sup>64</sup> The only exceptions are for scientific research. The possession of wire tracers or wire leaders is also prohibited.<sup>65</sup> Penalties range from USD 50,000 to 250,000 and any illegal fins seized will be incinerated.<sup>66</sup> Interestingly, provisions covering the law of evidence are included: it is a rebuttable presumption that any shark or shark fin found on board a vessel was caught in the FSM EEZ.<sup>67</sup> Moreover, tampering or destroying evidence, including a shark or fin, is a separate offence with a penalty of USD 100,000 to 500,000.<sup>68</sup> Purse seine vessels were given an initial six-month moratorium on these provisions; Public Law 19-21 was subsequently passed in 2015 to make the entirety of section 913 applicable to purse seine vessels. The law was further amended in 2015 under Public Law 19-36 to allow sharks caught as bycatch if dead to be 'recorded in the daily catch report form for the vessel and discarded'.<sup>69</sup> Section 913(8) is further clarified to confirm that there is a rebuttable presumption that any shark or shark fin found on board a vessel in the FSM EEZ was caught in that EEZ.

In the Marshall Islands, Public Law No. 2011-63 amended the Fisheries Act 1997 and prohibits targeted commercial fishing for sharks<sup>70</sup> as well as shark fishing generally, finning, mutilating, or injuring a shark.<sup>71</sup> Subsistence fishing is exempted (apart from catching protected species), as is other authorized taking.<sup>72</sup> Any shark caught as bycatch must be released, dead or alive.<sup>73</sup> The taking, possession, sale, transfer, storage, or trans-shipment of a shark or part is prohibited with a rebuttable presumption

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<sup>63</sup> Public Law No. 18-108, amending s. 913 of Title 24 of the Code of the Federated States of Micronesia on Marine Resources.

<sup>64</sup> Ibid.

<sup>65</sup> Ibid., s. 913(3).

<sup>66</sup> Ibid., s. 913(7) and (9).

<sup>67</sup> Ibid., s. 913(8).

<sup>68</sup> Ibid., s. 914.

<sup>69</sup> Ibid., s. 913(4).

<sup>70</sup> Fisheries Act 1997 (Marshall Islands), s. 229.

<sup>71</sup> Ibid., s. 229A(1).

<sup>72</sup> Ibid., s. 229A(2); see also sub-section (5).

<sup>73</sup> Ibid., s. 229A(3).

that possession indicates violation of the subsection.<sup>74</sup> The Act also prohibits the use of a trace wire.<sup>75</sup> Penalties include fines of USD 25,000 to 200,000.<sup>76</sup>

In Sri Lanka, fishing for thresher, big eye thresher, pelagic thresher, oceanic white tip and whale sharks is prohibited.<sup>77</sup> Removal of fins on board local vessels and the discarding of shark carcass is prohibited, as is retention, trans-shipment and landing of shark fins unless they are naturally attached.<sup>78</sup> Live sharks caught are to be released, particularly juveniles and pregnant animals.<sup>79</sup> Similar provisions are included for local vessels engaged on the high seas, with the addition of a prohibition on sale and offers for sale, the requirement to record any shark caught and released, and a prohibition on operating purse seine nets in any area inhabited by whale sharks.<sup>80</sup> Despite these forms of protection for specific species, it is clear that long-line fisheries do exist for other sharks.<sup>81</sup> Significantly, Sri Lanka has implemented the FAO Port State Measures Agreement, thus prohibiting the landing or selling of thresher or oceanic white tip sharks, and detached fins of other sharks.<sup>82</sup>

The Maldives has also taken significant steps to protect sharks, with early conservation efforts predating the declaration of the shark sanctuary in 2010. In 1995, 15 dive sites were declared MPAs and fishing for all sharks prohibited within them.<sup>83</sup> The General Fisheries Regulations under the Fisheries Law of the Maldives prohibited fishing for sharks within 12 nautical miles of seven named atolls,<sup>84</sup> or within three nautical miles of a fish aggregating device.<sup>85</sup> The Regulations also banned the catching, killing, fishing, or collecting of any whale sharks in the Maldivian EEZ.<sup>86</sup> Whale sharks have subsequently been listed as a protected species.<sup>87</sup> In 2010, the Maldives declared its entire EEZ to be a shark sanctuary by prohibiting fishing, harming, and trade in sharks, and listing all shark species as protected under the Fisheries Law of the Maldives.<sup>88</sup>

<sup>74</sup> *Ibid.*, s. 229A(4).

<sup>75</sup> *Ibid.*, s. 229A(6).

<sup>76</sup> *Ibid.*, s. 230.

<sup>77</sup> Shark Fisheries Management Regulations 2015 (Sri Lanka), reg. 2. Exceptions are provided for scientific research.

<sup>78</sup> *Ibid.*, reg. 3. See also the High Seas Fishing Operations Regulations 2014 (Sri Lanka).

<sup>79</sup> Shark Fisheries Management Regulations 2015 (Sri Lanka), reg. 4.

<sup>80</sup> Shark Fisheries Management (High Seas) Regulations 2015 (Sri Lanka), regs 2–6.

<sup>81</sup> Fishing Gear Marking Regulations 2015 (Sri Lanka).

<sup>82</sup> N. 44 above. Port State Measures to Prevent, Deter and Eliminate Illegal Unreported and Unregulated Fishing Regulations 2015.

<sup>83</sup> Dell’Apa, Smith & Kaneshiro-Pinerio, n. 9 above (citing R. Anderson & Z. Waheed, ‘Management of Shark Fisheries in the Maldives’, FAO Fisheries Technical Paper, 1999, pp. 367–401).

<sup>84</sup> General Fisheries Regulations (the Maldives), reg.12. The regulation is limited to 10 years from 1998 and the Baa, Lhaviyani, Kaafu (Male), North Ari, South Ari, Vaavu and Seenu (Addu) Atolls.

<sup>85</sup> *Ibid.*, reg. 18.

<sup>86</sup> *Ibid.*, reg. 13.

<sup>87</sup> Fisheries Law (the Maldives), Art. 10.

<sup>88</sup> Maldives Ministry of Fisheries and Agriculture, Press Release No. 30-D2/29/2010/32 (quoted in K. Ali & H. Sinan, ‘National Plan of Action for the Conservation and Management of Sharks in the Maldives’, IOTC-2015-WPEB-INF12, Sept. 2015, p. 15, available at: [http://www.iotc.org/sites/default/files/documents/2015/09/IOTC-2015-WPEB11-INF12\\_-\\_Maldives\\_NPOA\\_Sharks.pdf](http://www.iotc.org/sites/default/files/documents/2015/09/IOTC-2015-WPEB11-INF12_-_Maldives_NPOA_Sharks.pdf)). See also Ward-Paige, n. 5 above.



Some states have introduced specific legislation to address shark finning. In the Indian Ocean, the Seychelles has adopted the Fisheries (Shark Finning) Regulations under its Fisheries Act, which prohibits the removal of fins on board vessels without approval, as well as keeping or trans-shipping fins, and discarding carcasses.<sup>89</sup> Approval to remove the fins of a shark will be given only if the whole animal can be utilized, and will not be granted unless the ability to do so and the justification for separate processing is demonstrated. Even where approval is given, discarding a carcass at sea is prohibited,<sup>90</sup> and a 5% fin-to-weight ratio imposed.<sup>91</sup> Penalties include fines of up to 500,000 Seychellois rupees (SCR).<sup>92</sup> Mauritius also imposes a 5% fin-to-weight ratio, requires shark carcasses and fins to be landed from the same boat, and prohibits fins that have been trans-shipped from being landed in the state.<sup>93</sup> In Vanuatu, power is given to the Vanuatu Observer Program to check compliance with regulations for protected or vulnerable species, and to search vessels and confiscate any shark fins found.<sup>94</sup> Power is also given to pass regulations to protect individual species, but it is not clear whether this provision has been used in relation to sharks.<sup>95</sup> In Fiji, gear restrictions to prohibit wire traces apply only to offshore fisheries under the Offshore Fisheries Management Decree 2012 and Offshore Fisheries Management Regulations 2014.<sup>96</sup> The Decree also requires vessels licensed for offshore fishery to meet the requirements of the WCPFC, including the conservation management measures outlined above.<sup>97</sup> In Nauru, regulations prohibit the setting of purse seine nets within one nautical mile of a whale shark.<sup>98</sup> If a whale shark is inadvertently caught in such a net, the master must take all reasonable steps to release it, including ceasing fishing and not recommencing until the shark is released.<sup>99</sup> Almost identical provisions exist under the laws of the Solomon Islands.<sup>100</sup>

Although most trade measures relate directly to the implementation of CITES provisions, as noted above, several other provisions are relevant. In Tonga, however, the Fisheries Management (Processing and Export) Regulations 2008 have set the fee for a shark fin export licence. Furthermore, shark fins, dogfish, and other sharks are

<sup>89</sup> Fisheries (Shark Finning) Regulations (the Seychelles), reg. 5.

<sup>90</sup> *Ibid.*, reg. 6.

<sup>91</sup> *Ibid.*, reg. 7.

<sup>92</sup> *Ibid.*, reg. 10.

<sup>93</sup> Fisheries and Marine Resources (Import of Fish and Fish Products) Regulations 2012 (Mauritius), regs 13 and 14.

<sup>94</sup> Fisheries Act 2014 (Vanuatu), s. 115(2)(g).

<sup>95</sup> *Ibid.*, s. 147.

<sup>96</sup> Offshore Fisheries Management Regulations 2014 (Fiji), reg. 6, Sch. 2C.

<sup>97</sup> K. Chand, 'A Legal Policy Discussion of Shark Conservation in Fiji', *Swatibau & Sloan*, 20 Feb. 2017, available at: <http://www.sas.com.fj/ocean-law-bulletins/a-legal-policy-discussion-of-shark-conservation-in-fiji>.

<sup>98</sup> Fisheries Act 1997 – Fisheries (PNA Third Implementing Arrangement) Regulations 2009, reg. 6A, inserted by the Fisheries (PNA Third Implementing Arrangement) (Amendment) Regulations 2010 (Nauru).

<sup>99</sup> *Ibid.*, reg. 6A(2).

<sup>100</sup> Fisheries (PNA Third Implementation Arrangement) Regulations 2012, reg. 7. However, the Solomon Islands has a long-line shark fishery and permits export: Fisheries (Fees) (Amendment) Regulations 2013.

included within import and export duty legislation under the Customs Act 2007 – Customs Duty (Amendment) (No. 3) Order 2013. Similar provisions exist under the Papua New Guinean Customs Tariff (2011 Budget) (Amendment) Act 2010 and Vanuatu’s Export Duties Joint Regulation (Amendment) Act 1988. In Mauritius and the Seychelles, laws regulate how sharks are to be displayed in the local market.<sup>101</sup> The Seychelles also has regulations setting the maximum levels of heavy metals in sharks permitted for export.<sup>102</sup> All of these provisions confirm the continuation of shark fishing in these jurisdictions.

Seven countries in the Pacific have declared shark sanctuaries covering their entire waters, representing almost half of the total number of shark sanctuaries worldwide.<sup>103</sup> Only the Maldives in the Indian Ocean has similarly created a shark sanctuary. These shark sanctuaries, or ‘shark parks’, have attracted considerable attention, but relatively little legal research. In addition to the laws explored above, Palau and Kiribati have adopted specific laws to give effect to their shark sanctuaries, and to a lesser extent Fiji and Madagascar have also utilized area-based laws.

Palau is said to be the first country in the world to close its entire EEZ to commercial shark fishing, which it did in 2009.<sup>104</sup> There was, however, an earlier law that recognized sharks injured by steel leaders and prohibited foreign fishing vessels from utilizing them in Palauan waters.<sup>105</sup> Subsequently, the Shark Haven Act made it illegal to catch or intentionally fish for sharks, with the exception that Palauan citizens (or wholly owned entities) could catch up to one shark a day, incidental to other fishing, provided it was landed whole, reported, and not used for commercial purposes.<sup>106</sup> This provision also prohibited shark finning and chumming to attract sharks, possession, transfer, storage or trans-shipment of sharks or parts, and required that sharks incidentally caught as bycatch be released dead or alive. Fishing is defined broadly to include catching, as well as attempting to take or engage in activity likely to result in the taking of a shark.<sup>107</sup> Placing or recovering a fish-aggregating device is also prohibited.<sup>108</sup> Gear is also restricted, with steel leaders prohibited.<sup>109</sup> As with other Pacific laws, there is a rebuttable presumption that anyone found with a shark or part had caught it in breach of these provisions. Penalties include fines of up to USD 250,000, with separate offences in relation to each shark or part found.<sup>110</sup> The later Marine Sanctuary Act 2015 strengthened these provisions by prohibiting all fishing for sharks and fishing for any

<sup>101</sup> Mauritius Local Government Act 2011, District Council of Savanne (Markets) Regulations 2014, reg. 4(4); Seychelles Public Health Act 1960, Public Health (Market) Regulations.

<sup>102</sup> Export of Fishery Products (Sanitary) Regulations 2010 (the Seychelles).

<sup>103</sup> Atlas of Marine Protection, ‘Shark Sanctuary’, available at: <http://www.mpatlas.org/category/shark-sanctuary>.

<sup>104</sup> Shark Haven Act 2009 (Palau).

<sup>105</sup> Amendment to Title 27 of Palau National Code, Division 1, Ch. 1 (RPPL No. 6-36).

<sup>106</sup> Shark Haven Act 2009, amending Title 27 of the Palau National Code, s. 181.

<sup>107</sup> *Ibid.*, s. 102(i).

<sup>108</sup> *Ibid.*

<sup>109</sup> *Ibid.*, s. 181(b).

<sup>110</sup> Shark Haven Act 2009, amending Title 27 of the Palau National Code, s. 182.

living resources within the sanctuary.<sup>111</sup> The 2015 Act also amended the Marine Protection Act 1994 by prohibiting the fishing or finning of sharks, requiring bycatch to be released and regulating export, trans-shipment and transport.<sup>112</sup> Penalties were also increased to between USD 500,000 and 1,000,000, with each shark constituting a separate offence.<sup>113</sup>

Kiribati declared a shark sanctuary under the Shark Sanctuary Regulations (2015) pursuant to its Fisheries Act 2010. The Regulations aim specifically to conserve sharks<sup>114</sup> and ‘protect the balance of the marine ecosystem’ with reference to the national economy and shark-related tourism as well as Kiribati’s global reputation.<sup>115</sup> The Kiribati Shark Sanctuary is an area within which it is illegal to capture, kill, fish for, or fin a shark,<sup>116</sup> to offer for sale, sell, import or export,<sup>117</sup> or to possess (in person or on board a vessel) a shark or shark part.<sup>118</sup> Although specific reference is not made to bycatch, regulation 5(2) notes that, by way of defence, it is possible to argue that the shark was caught inadvertently and released immediately. The possession and use of wire traces is also banned.<sup>119</sup> Exceptions are provided for authorized use and to prevent a risk to human health, and i-Kiribati people not engaged in commercial trade are exempted from restrictions provided they do not catch a shark species that warrants special protection.<sup>120</sup> Penalties are relatively low: 5,000 Kiribati dollars for an individual and up to 10,000 Kiribati dollars for a vessel.<sup>121</sup> As in some other jurisdictions, there are penalties for destroying evidence.<sup>122</sup>

Although declared under the Fisheries Act, the Fijian Fisheries (Shark Reef Marine Reserve) (Serua) Regulations 2014 provide a protected area for sharks in one part of Fijian waters. The marine reserve was declared to conserve, protect, and maintain sharks and other species.<sup>123</sup> Any fishing activity that consists of collecting any species of shark is prohibited,<sup>124</sup> as is the use of indiscriminate fishing gear to target sharks.<sup>125</sup> Penalties include fines of between 500 and 10,000 Fijian dollars, or imprisonment.<sup>126</sup> Exceptions are made for scientific research where authorized.<sup>127</sup>

<sup>111</sup> Marine Sanctuary Act 2015 (Palau), amending Title 27 of the Palau National Code, s. 181.

<sup>112</sup> Marine Sanctuary Act 2015, amending the Marine Protection Act 1994 (Palau), ss. 1203, 1204 and 1209.

<sup>113</sup> Marine Sanctuary Act 2015, s. 182(b)

<sup>114</sup> Sharks are defined to include eight orders: Shark Sanctuary Regulations 2015 (Kiribati), reg. 3.

<sup>115</sup> *Ibid.*, reg. 2.

<sup>116</sup> *Ibid.*, reg. 5.

<sup>117</sup> *Ibid.*, reg. 6(2).

<sup>118</sup> *Ibid.*, reg. 6(1) and (3).

<sup>119</sup> *Ibid.*, reg. 7. Foreign fishing vessels are exempt: reg. 8(3).

<sup>120</sup> *Ibid.*, reg. 8. See reg. 10 regarding limitations on authorized exceptions. Sharks warranting special protection are set out in Sch. 11 and include oceanic white tip, silky, whale, great white, and basking sharks.

<sup>121</sup> *Ibid.*, reg. 9.

<sup>122</sup> *Ibid.*, reg. 17.

<sup>123</sup> Fisheries (Shark Reef Marine Reserve) (Serua) Regulations 2014 (Fiji), s. 3(1).

<sup>124</sup> *Ibid.*, s. 3(5).

<sup>125</sup> *Ibid.*, s. 4(2).

<sup>126</sup> *Ibid.*, s. 3(6).

<sup>127</sup> *Ibid.*, s. 5.

In Madagascar, few laws protect or manage sharks. Those Ordinances and Decrees that do seek to protect endangered species or manage fisheries do not list any shark species.<sup>128</sup> Recently, however, provisions that allow the national government to transfer natural resource governance to local communities have been utilized to conserve sharks. These laws allow a *dina* to be created, establishing a community-based management agreement.<sup>129</sup> Such agreements can be validated by a Malagasy court provided they do not conflict with other national legislation, and then enforced under Law 2001-004.<sup>130</sup> A shark sanctuary was created in Antongil Bay in 2015 as a *dina* and a Locally Managed Marine Area (LMMA), prohibiting shark fishing and protecting 19 shark species previously harvested.<sup>131</sup> The only other provisions are found in foreign fishing fleet tuna agreements, which limit the number of sharks harvested as bycatch.<sup>132</sup>

The above analysis demonstrates striking differences between the Indian Ocean and Pacific Ocean island states. While the adoption of shark conservation and management measures are influenced to an extent by international instruments, the variances in the laws are likely to relate at least in part to underlying cultural diversity, given the history of customs and practices surrounding sharks in the Pacific and the history of shark fishing in the Indian Ocean. While such a finding is important in itself, it also has implications for new and emerging issues. Some recent developments are explored below to highlight these issues and their ramifications.

#### 4. TOURISM, AQUACULTURE, AND HUMAN SAFETY

Most of the legal provisions considered above relate to fishing and seek to protect sharks from targeted and incidental harvest. In addition, non-consumptive industries have emerged, which provide employment and economic benefits, and serve a secondary purpose in terms of raising awareness about the importance of sharks. Marine-based tourism has developed in many areas of the Indo-Pacific where sharks aggregate. Whale sharks, for example, migrate through the Indian Ocean and South China Sea with aggregation sites on the west coast of Australia, India, Indonesia, the Maldives, Thailand, and the Philippines.<sup>133</sup> Not all of these places have developed shark-based tourism: in Indonesia, for example, such an industry has not emerged to

<sup>128</sup> Humber et al. (n. 3 above, p. 79) state that ‘Decree 2006-400 only mentions one species of elasmobranch’ but that has not been confirmed by this research. See also A. Keane et al., ‘Evidence for the Effects of Environmental Engagement and Education on Knowledge of Wildlife Laws in Madagascar’ (2011) 4(1) *Conservation Letters*, pp. 55–63.

<sup>129</sup> Law 96-025, Arts 49–52 (Madagascar).

<sup>130</sup> Humber et al., n. 3 above.

<sup>131</sup> *Ibid.*, p. 79; L. Brenna, ‘Madagascar Creates a Sanctuary for Sharks’, *Lifegate*, 19 Feb. 2015, available at: <https://www.lifegate.com/people/news/madagascar-sanctuary-sharks>. Earlier in 2010, the Bay was put under temporary full protection by an inter-ministerial Decree (No. 52005/2010): US Aid, ‘Marine Biodiversity and Fisheries in Madagascar: A Biodiversity and Extractives Political Economy Assessment Summary’, available at: [http://www.integralc.com/wp-content/uploads/2017/08/USAID-Madagascar-PEA-Summary\\_Approved\\_Updated-1.pdf](http://www.integralc.com/wp-content/uploads/2017/08/USAID-Madagascar-PEA-Summary_Approved_Updated-1.pdf).

<sup>132</sup> Humber et al., n. 3 above, p. 72.

<sup>133</sup> Stacey et al., n. 10 above, p. 64.

any great extent.<sup>134</sup> In contrast, where historically fishing has dominated, some tourism enterprises now focus on experiences associated with traditional hunting.<sup>135</sup> Despite the rapidly growing number of shark-based tourism enterprises, regulatory measures to control and manage operators and visitors, and to protect the sharks, tend to lag behind. For the most part only soft laws, such as guidelines and codes of conduct, are in place. Licensing of tourism operations and ensuring suitable qualifications or training for those running such enterprises are critical aspects for which binding law is needed.

Other emerging concerns relate to visitor behaviour, including touching and photographing sharks, as well as the way in which sharks are attracted to boats and cages. In particular, scientists have demonstrated that factors such as provisioning or baiting sharks can have negative impacts on them.<sup>136</sup> In some Indo-Pacific jurisdictions, including South Africa and Australia, strict regulations exist to manage the number of operators and visitors, and to control feeding and baiting,<sup>137</sup> whereas other jurisdictions, such as Mozambique, have no formal regulation.<sup>138</sup> Whale shark tourism in the Maldives is subject to a code of conduct, but there is evidence of non-adherence and poor self-regulation leading to calls for greater regulation in this country.<sup>139</sup> A common thread across a number of states is that guidelines and codes of conduct are difficult to enforce and therefore may not adequately protect sharks or people, leading to pressure for tighter regulation to include binding provisions.<sup>140</sup> This is not uncontroversial, even in the context of developed countries, with the proposed New Zealand Shark Cage Diving (Permitting and Safety) Bill recently being rejected.<sup>141</sup> The Bill sought to create a licensing scheme for commercial shark cage diving operators to minimize impacts on sharks and mitigate risks to people. The Bill was rejected primarily because there was a case lodged contemporaneously before the New Zealand Court of Appeal by the Paua fishery industry relating to human safety concerns associated with shark cage diving. Ultimately the Court found that shark cage diving was an offence under the New Zealand Wildlife Act 1953, and could not be authorized

<sup>134</sup> Ibid., p. 64.

<sup>135</sup> Ibid., p. 72.

<sup>136</sup> Provisioning refers to feeding sharks, which can alter natural hunting patterns and habituate sharks to humans. Baiting includes chumming or berleying the water by adding blood or fish oil to attract sharks to operators; this can result in wasted energy as sharks are attracted to the 'food' but none is provided: see, e.g., Richards et al., n. 6 above; M.B. Orams, 'Feeding Wildlife as a Tourism Attraction: A Review of Issues and Impacts' (2002) 23 *Tourism Management*, pp. 281–93.

<sup>137</sup> In South Africa, the Marine Living Resources Act 1998 prohibits the feeding of great white sharks but permits chumming. Whale shark tourism activities in Western Australia are regulated under the Conservation and Land Management Act 1984 and the Wildlife Conservation Act 1950. In South Australia, great white shark cage diving is regulated by the National Parks and Wildlife Act 1972 and the Fisheries Management (General) Regulations 2007.

<sup>138</sup> Richards et al., n. 6 above.

<sup>139</sup> E. Reguly, 'Dream of Swimming with Whale Sharks? Know That It's a Nightmare for Them', *The Globe and Mail*, 3 May 2018, available at: <https://www.theglobeandmail.com/life/travel/article-dream-of-swimming-with-whale-sharks-know-that-its-a-nightmare-for>.

<sup>140</sup> Richards et al., n. 6 above.

<sup>141</sup> T. Newman, 'Shark Cage Diving Bill Knocked Back', *The Southland Times*, 7 May 2018, available at: <https://www.stuff.co.nz/southland-times/news/103677507/shark-cage-diving-bill-knocked-back>.

by the government.<sup>142</sup> This brings sharply into focus the broader connection between tourism and human safety, a subject that has led to considerable controversy in the Indian Ocean.

La Réunion is an external French territory in the South West Indian Ocean. Historically, shark attacks averaged just over one per year, but in 2011 there were six incidents and two per year in 2012 and 2013, mostly involving bull sharks.<sup>143</sup> What is most striking is the government response: as well as implementing shark nets, the government imposed a ban on using the marine environment for swimming or surfing at the sites of the attacks.<sup>144</sup> When there was a similar increase in shark attacks in Western Australia in 2013, the response was the implementation of a catch-and-kill policy. In Australia, great white sharks were implicated in the majority of attacks, a species that is protected both internationally and nationally. The legality of the catch-and-kill policy was unsuccessfully questioned in the Western Australian Supreme Court.<sup>145</sup> Simultaneously, scientists also argued against the cull, partly on the basis that similar approaches had proved to be ineffective in other locations such as Hawaii.<sup>146</sup> Ultimately the programme was discontinued, but in the aftermath researchers explored the issues from a variety of perspectives including socio-cultural attitudes and the role of the media and culture.<sup>147</sup> These differing government actions to address human safety risks, and the public responses to them, demonstrate the complexity of the issues and socio-cultural influences that can impact upon the success or failure of the initiatives.

Relatively few legal measures deal with the issue of human safety in the Pacific. In Tuvalu an exception under the Arms and Ammunition Act – Prohibition of Importation of Arms and Ammunition Order 1997 allows shark protection devices to be brought into the country. In Samoa the Marine Wildlife Protection Regulations 2009 include an exception under regulation 11(3) that '[i]t shall not be an offence ... if a shark is killed for the purpose of protecting human life'. Furthermore, it is not an offence in Kiribati to fish for, catch or possess a shark if it is 'reasonably necessary to prevent a risk to human health'.<sup>148</sup>

<sup>142</sup> *PauaMAC5 Incorporated v. Director-General of Conservation*, Judgment, 4 Sept. 2018, CA355/2017, [2018] NZCA 348.

<sup>143</sup> A. Lemahieu et al., 'Human-Shark Interactions: The Case Study of Reunion Island in the South-West Indian Ocean' (2017) 136 *Ocean and Coastal Management*, pp. 73–82. In total there were 18 shark attacks between 2011 and 2016: Global Shark Attack File, available at: <http://www.sharkattackfile.net/incidentlog.htm>.

<sup>144</sup> G. Chambers, 'Reunion Shark Nets Snatch Victory from Jaws of Ruin', *The Australian*, 18 Mar. 2016, available at: <https://www.theaustralian.com.au/national-affairs/state-politics/reunion-shark-nets-snatch-victory-from-jaws-of-ruin/news-story/7dfcdfd2e15259a6455cc20819169aa3> (on subscription only).

<sup>145</sup> *Sea Shepherd Australia Pty Ltd v. Western Australia*, Judgment, BC201403180, (2014) 313 ALR 208; [2014] WASC 66 (S). See also P.W. Pearlman & E.J. Techera, 'Sharks: Conservation, Culling and Controversy' (2015) 30(2–3) *Australian Environment Review*, pp. 56–61.

<sup>146</sup> C. McCagh, J. Sneddon & D. Blache, 'Killing Sharks: The Media's Role in Public and Political Response to Fatal Human-Shark Interactions' (2015) 62 *Marine Policy*, pp. 271–8.

<sup>147</sup> L. Gibbs & A. Warren, 'Killing Sharks: Culture and Politics of Encounter and the Sea' (2014) 45(2) *Australian Geographer*, pp. 101–7; McCagh, Sneddon & Blache, *ibid.*; C. Neff, 'The Jaws Effect: How Movie Narratives are Used to Influence Policy Responses to Shark Bites in Western Australia' (2015) 50(1) *Australian Journal of Political Science*, pp. 114–27.

<sup>148</sup> Shark Sanctuary Regulations 2015 (Kiribati), reg. 8(1)(b).

Although the precise cause of the increase in human-shark interactions in La Réunion is unknown, it is clear that when fewer people were in the water there were fewer attacks.<sup>149</sup> This does not prove, however, that sharks are attracted to humans, although some research indicates that activities such as aquaculture can attract bull sharks.<sup>150</sup> The link with aquaculture appears to have been influential in later concerns expressed about the introduction of inshore fish farming in the Seychelles, discussed below. Human safety was already the subject of concern in the Seychelles, with two fatal shark attacks in 2011 on Praslin Island. Although again the cause was unknown, it was suggested that food disposal from yachts and pleasure craft had attracted sharks close to shore.<sup>151</sup> The response was to install shark nets at the beach where the attacks occurred, introduce shark patrols, and employ baited drum lines.<sup>152</sup> There have been no further shark incidents since then and the Seychelles Maritime Safety Authority removed the nets in January 2017.<sup>153</sup> Beach nets are controversial as they not only catch sharks but have also been implicated in the death of marine mammals and other species inadvertently caught in them.<sup>154</sup>

The fear of human-shark interactions appears to be influential in the issue of inshore aquaculture developments in the Indian Ocean, and is therefore another rich area for teasing out regional differences. Both the Seychelles and Mauritius have recently experienced tensions associated with proposed inshore fish farming. In the Seychelles, for example, proposed marine aquaculture developments have raised public concerns about the possibility of increased shark activity.<sup>155</sup> Local hotel owners in Mauritius have brought proceedings before the Environmental and Land Appeals Tribunal to challenge the Department of Fisheries' plans to install fish farms inside the lagoon, and collaborative action has been taken through the 'No to Fish Farming at Sea Collective'.<sup>156</sup> This is somewhat surprising, given that Mauritius has a long history

<sup>149</sup> Lemahieu et al., n. 143 above.

<sup>150</sup> N. Loiseau et al., 'Using an Unbaited Stationary Video System to Investigate the Behaviour and Interactions of Bull Sharks *Carcharhinus Leucas* under an Aquaculture Farm' (2016) 38(1) *African Journal of Marine Science*, pp. 73–9. Other research indicates that there are few incidences of great white shark interaction with tuna pens, leading to the inference that these aquaculture facilities are not strong attractions for these animals: T. Galaz & A. de Maddalena, 'On a Great White Shark Trapped in a Tuna Cage off Libya, Mediterranean Sea' (2004) 14 *Annales Series Historia Naturalis*, pp. 159–63.

<sup>151</sup> A. Ebrahim, 'Aquaculture in Seychelles?', *eTurboNews*, 27 Aug. 2017, available at: <https://www.eturbo-news.com/162808/aquaculture-in-seychelles>.

<sup>152</sup> Seychelles Nation, 'Shark Experts Brief Local Authorities on Initial Findings', 27 Aug. 2011, available at: <http://www.nation.sc/article.html?id=231843>.

<sup>153</sup> S.M. Jean & B. Bonnelame, 'Seychelles Maritime Safety Authority Removes Safety Nets at Anse Lazio Beach 5 Years after Shark Attacks', *Seychelles Newsagency*, 3 Jan. 2017, available at: <http://www.seychellesnewsagency.com/articles/6534/Seychelles+Maritime+Safety+Authority+removes+safety+nets+at+Anse+Lazio+beach++years+after+shark+attacks>.

<sup>154</sup> G. Cliff & S.F.J. Dudley, 'Reducing the Environmental Impact of Shark-Control Programs: A Case Study from KwaZulu-Natal, South Africa' (2011) 62(6) *Marine and Freshwater Research*, pp. 700–9; B. MacKenzie & L. White, 'Shark Net Figures Show Massive Amount of Marine Bycatch Compared to Smart Drumlines', *ABC News*, 22 May 2018, available at: <https://www.abc.net.au/news/2018-05-22/shark-nets-figures-show-more-bycatch-compared-to-drumlines/9787964>.

<sup>155</sup> Ebrahim, n. 151 above.

<sup>156</sup> 'Aquaculture Project in the West: The Controversy is Growing', *Le Mauricien*, 23 July 2017, available at: <https://www.lemauricien.com/article/projet-d-aquaculture-l-ouest-la-polemique-s-amplifie/2018>;

of traditional *barchois* aquaculture in the lagoon and considering that more recent fish farming initiatives, which commenced in 2005, did not result in an increased incidence of shark attacks.<sup>157</sup> The lack of shark-based tourism in Mauritius and the Seychelles may account in part for the concern, but the absence of any cultural attachment to sharks may also have played a role. Further research is needed to determine the parameters and extent of socio-cultural influence on the regulation of human-shark interactions before mechanisms can be developed to avoid such tensions in the future.

## 5. PATTERNS AND TRENDS IN THE SHARK LAWS OF INDO-PACIFIC ISLANDS

The exploration of the legal responses to shark conservation and management reveals a number of patterns. The first observation is that many countries have taken a common approach of declaring shark sanctuaries. These declarations over the last nine years have received considerable public attention but less legal analysis. Many more sanctuaries have been declared in the Pacific than in the Indian Ocean, probably as a result of differences in the underlying cultural attitudes towards sharks combined with no history of human-shark interactions.

The second observation is that although the legal mechanisms vary in terms of the protection they offer, in general they do not constitute genuine MPAs but rather utilize fisheries provisions to prohibit the targeted commercial fishing of sharks inside national waters. Regulations do not create general no-take zones, so sharks could still inadvertently be caught as bycatch. Although much of the law explored above has sought to address the shark bycatch issue by prohibiting the retention of a shark, this remains a significant problem.<sup>158</sup> Given that the waters now covered by these laws were previously subject to targeted shark fishing, the fisheries restrictions have the potential to contribute significantly to shark conservation.

The third observation is that the declaration of the sanctuaries and adoption of fisheries controls are just the first steps in the conservation and management of sharks. Now that the laws have been adopted, the key issues for the future will be their implementation, compliance and enforcement. These matters rely in part upon legal, technical, and financial capacity, which are often very limited in SIDS. The challenges in monitoring large ocean areas are well recognized, and although technologies such as

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Y.J. Yugtha, 'Aquaculture Farms: A Danger to our Marine Ecosystems', *ELI Africa*, 5 July 2017, available at: <http://www.eli-africa.org/2017/07/aquaculture-farms-a-danger-to-our-marine-ecosystems>.

<sup>157</sup> B. Pierre et al., 'Accelerating the Development of Sustainable Aquaculture Industry in Mauritius', BOI/NB/JAN15/02, AFD-Board of Investment, Mauritius, 8 Sept. 2015, available at: <https://docplayer.net/90190733-Accelerating-the-development-of-sustainable-aquaculture-industry-in-mauritius.html>; 'Aquaculture Project in the West: The Controversy is Growing', *Le Mauricien*, 23 July 2017, available at: <https://www.lemauricien.com/article/projet-d-aquaculture-l-ouest-la-polemique-s-amplifie>; 'Fish Farms: Emerging Threats Coming Ashore', *L'Express*, 28 June 2007, available at: <https://www.lexpress.mu/article/fish-farms-emerging-threats-coming-ashore>; K. Walter, 'Aquaculture: "Growfish Makes Sure There is No Chance for Her to be Responsible for a Shark Attack"', *L'Express*, 24 July 2017, available at: <https://www.lexpress.mu/article/312580/aquaculture-growfish-fait-en-sort-qu'il-ny-ait-aucune-chance-pour-elle-detre>.

<sup>158</sup> Ward-Paige, n. 5 above.



satellites and drones offer opportunities to enhance surveillance, their utilization will further strain limited resources, placing them out of reach for some Indo-Pacific nations.<sup>159</sup> Given that most of the laws are relatively recent, effectiveness in terms of curtailing shark fishing and improving species' health and conservation status cannot yet be comprehensively evaluated. Catch statistics and other data are either not available for the majority of the countries or out of date.<sup>160</sup> Future empirical research is needed to measure success through analysis of implementation and management plans, compliance mechanisms, infringements and prosecutions, as well as landings of sharks or their parts.

The fourth observation is that the shark laws with the strictest controls and broadest scope are found in the Pacific. Palau, the Marshall Islands and FSM protect all species in all waters and from a range of targeted and incidental catch. Their commitment is further shown through the collaborative establishment of the world's first regional shark sanctuary covering their respective adjoining EEZs.<sup>161</sup> The Cook Islands and Kiribati also have strong measures in place. These states also exhibit cultural traditions associated with sharks. The Maldives is the only Indian Ocean island country to have declared its waters to be a shark sanctuary. In keeping with other states in the region, the Maldives has little evidence of cultural traditions associated with sharks other than a long-standing fishing sector. However, it relies heavily on the marine environment as an asset for its tourism industry, as do other Indian Ocean states such as Mauritius and the Seychelles. Unlike these last two countries, the Maldives also has a strong shark-based tourism industry that has lobbied for protection, which may explain in part the very different approach it has taken to shark conservation.<sup>162</sup> It may be that the Maldives, with its history of shark fishing and the absence of cultural reverence for sharks, will be challenged more in terms of compliance with and enforcement of its law. Nevertheless, the economic motivations for the measures could prove to be a strong enough driver for effective enforcement.

It is clear that much weaker conservation measures are in place in many states such as Tonga and Vanuatu in the Pacific, and Mauritius and the Seychelles in the Indian Ocean. Why this is the case in the two Pacific states requires further research, given the strong cultural values associated with sharks in this region. It could be related to multiple factors such as a lack of shark data demonstrating conservation concerns, a greater tradition of shark fishing, limited opportunities associated with shark-based tourism, a reduced legal and technical capacity to adopt and implement new law, and/or the pressure of competing priorities; however, these hypotheses must be tested. Concerns about public safety in the Indian Ocean appear to have dominated over

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<sup>159</sup> D. Bradley et al., 'Leveraging Satellite Technology to Create True Shark Sanctuaries' (2018) *Conservation Letters*, doi: 10.1111/conl.12610.

<sup>160</sup> See, e.g., F. Dent & S. Clarke, *State of the Global Market for Shark Products* (FAO, 2015). Only Mauritius and Vanuatu are mentioned in the report and only very limited information is available.

<sup>161</sup> Pew Charitable Trusts, 'Pacific Islands Collaborate to Enforce World's First Regional Shark Sanctuary', 21 Apr. 2016, available at: <http://www.pewtrusts.org/en/research-and-analysis/analysis/2016/04/21/pacific-islands-collaborate-to-enforce-worlds-first-regional-shark-sanctuary>.

<sup>162</sup> Anderson & Waheed, n. 83 above.

conservation interests. Human safety concerns only feature explicitly in Tuvalu and Samoan legislation (although the latter has subsequently declared its intention to protect sharks across its entire EEZ). It does not appear that human safety is a significant issue in this region, as it is in the Indian Ocean. La Réunion has already taken radical steps following a spate of shark attacks. The Seychelles also did so, but it has since removed most of them as no further human-shark interactions have occurred. The major fears appear to be related to potential impacts on tourists and the tourism industry, as well as on local people. Private industry and public concerns raised in both the Seychelles and Mauritius around inshore aquaculture and the potential to attract sharks into the lagoon demonstrate the importance of unpacking the complexity of attitudes towards and values associated with sharks.

Although the conservation of sharks appears to have outweighed human safety concerns in much of the Pacific, it should be noted that countries such as Palau and the Marshall Islands have not had any incidents for many decades,<sup>163</sup> and others such as FSM and the Cook Islands have never had a fatal attack.<sup>164</sup> Similarly, the Maldives and Sri Lanka have little or no history of shark incidents.<sup>165</sup> It appears that shark conservation laws are weaker in countries where such incidents have occurred, such as Papua New Guinea, Fiji, Vanuatu, and the Solomon Islands. Further research is needed to explore whether the higher incidence of shark attacks has in fact reduced conservation efforts in these countries. States such as Mauritius and the Seychelles also have very low incidents of human-shark interaction, but it seems that attacks occurring in the waters surrounding neighbouring islands are influencing attitudes.

Although cultural respect and reverence for sharks is a relevant factor, it is not by itself sufficient to secure their survival. In their study of the Gilbert Islands in Kiribati, Drew, Philipp and Westneat show that historical shark tooth weapons evidence the presence of spot-tail and dusky sharks in the past, but they have not been recorded in contemporary baseline studies.<sup>166</sup> Therefore, even in the Pacific where sharks have traditionally been culturally important, extinctions may be attributable (at least in part) to humans. Further research is needed to determine in each jurisdiction the extent of socio-cultural influences on shark conservation and attitudes towards legal measures. Such research must extend beyond customary beliefs and traditions that have been weakened by processes of colonization, globalization and modernization, to include contemporary values and relationships with other social factors. Where comprehensive socio-cultural research has been carried out, findings indicate that attitudes towards

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<sup>163</sup> Shark Attack Data, 'All Shark Attacks in Palau', available at: <http://www.sharkattackdata.com/place/palau>; Shark Attack Data, 'All Shark Attacks in Marshall Islands', available at: [http://www.sharkattackdata.com/place/marshall\\_islands](http://www.sharkattackdata.com/place/marshall_islands).

<sup>164</sup> Shark Attack Data, 'All Shark Attacks in Micronesia', available at: <http://www.sharkattackdata.com/country-overview/micronesia>; Shark Attack Data, 'All Shark Attacks in Cook Islands', available at: [http://www.sharkattackdata.com/country-overview/cook\\_islands](http://www.sharkattackdata.com/country-overview/cook_islands).

<sup>165</sup> Shark Attack Data, 'All Shark Attacks in Maldives', available at: <http://www.sharkattackdata.com/country-overview/maldives>; Shark Attack Data, 'All Shark Attacks in Sri Lanka', available at: [http://www.sharkattackdata.com/country-overview/sri\\_lanka](http://www.sharkattackdata.com/country-overview/sri_lanka).

<sup>166</sup> Drew, Philipp & Westneat, n. 18 above.

sharks and regulatory responses are complex, and there is nothing to suggest that similar complexity would not also be found in the Indo-Pacific island states.<sup>167</sup> To take full advantage of community values that support shark conservation and to overcome those that do not, the complex socio-cultural influences must be unpacked.

Finally, it is clear that tourism plays a number of valuable roles in raising awareness about sharks and providing non-consumptive economic benefits. It can therefore educate people who have no values associated with sharks. Tourism is also an important alternative livelihood to fishing, but in many parts of the world it is poorly regulated. Tourism regulation is needed to manage the industry, control visitors, and protect the sharks involved. Yet few of the Indo-Pacific island states have specific shark-based tourism laws and these are necessary as part of the mosaic of legal measures to ensure effective shark conservation. Research has pointed to the importance of shark-based tourism regulation with calls for legally enforceable provisions for operators.<sup>168</sup> This adds to other research demonstrating that lack of legislation in general is a driver of the decline in shark species.<sup>169</sup>

## 6. CONCLUSION

Human-shark interactions span millennia, with the earliest dating back to the Bronze age.<sup>170</sup> Evidence of shark fishing has been found in ancient trade locations, on pottery and mosaics, and in the writings of Aristotle and Pliny the Elder, demonstrating a wide range of values, including utilization, fear, reverence, and scientific curiosity.<sup>171</sup> It is clear, therefore, that current concerns, conflicts and interactions with sharks are just a further step on this human-shark interactive journey. Yet as evidence mounts of the continued decline of these ancient species, more effective ways and means must quickly be found to secure their future.

In many parts of the Pacific, sharks were sacred and culturally important, leading to limited shark fishing. This traditional foundation remains influential: Palau, for example, makes specific reference to culture in its shark legislation.<sup>172</sup> In much of the Indian Ocean, traditions associated with sharks tend to be only fishing-focused. Socio-cultural support for conservation is less evident, highlighted particularly by the debates about inshore aquaculture. In these states, the lack of cultural traditions associated with sharks provides no counterbalance to increased human safety and economic concerns.

The rapid expansion of shark sanctuaries and other shark-based conservation measures is a positive sign that concern for sharks is becoming more widespread.

<sup>167</sup> For the West Australian context see Gibbs & Warren, n. 2 above; McCagh, Sneddon & Blache, n. 146 above.

<sup>168</sup> Richards et al., n. 6 above.

<sup>169</sup> Humber et al., n. 3 above, p. 78.

<sup>170</sup> A.R. Mojetta et al., 'Where Sharks Met Humans: The Mediterranean Sea, History and Myth of an Ancient Interaction between Two Dominant Predators' (2018) 21 *Regional Studies in Marine Science*, pp. 30–8.

<sup>171</sup> Ibid.

<sup>172</sup> 'Palau's Economic and Cultural Fate Is Inextricably Tied to the Ocean, and Sharks Play an Integral Role in Maintaining the Ocean's Complex Ecological Balance': Shark Haven Act 2009; and '[P]rotecting and preserving Palau's environment is an essential part of Palauan culture (Bul system)': Palau National Marine Sanctuary Act 2015, s. 2.

Yet, most of the legal provisions are less than ten years old and their effectiveness is still to be determined. Empirical work will be needed on the ground in each jurisdiction to determine the extent of implementation, compliance, and enforcement efforts; all of which are likely to be impacted upon by a lack of technical, legal, and financial resources and capacity. Concern has been raised about the ability to measure success given that few of the laws require monitoring and baseline data is limited, thus hampering evaluation of accurate shark numbers.<sup>173</sup> Nonetheless, non-governmental organizations and governments will be keen to demonstrate that these restrictive measures are what is needed to ensure the future of sharks. Social sciences – including fields such as sociology, psychology, politics, law, media, and communications – have a clear role to play in securing public support and the political will to adopt legal measures to conserve and manage sharks, as well as in determining how implementation can best be achieved. It is clear that written law is not enough; paper parks and unenforced protection are of little value. To ensure effectiveness, it is critical to harness supportive cultural values where they exist, and to understand and overcome the fear and cultural demonization that has hitherto prevented conservation goals being met.

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<sup>173</sup> Ward-Paige, n. 5 above.