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6 The international institutional framework for seabird conservation in the South Pacific

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Introduction

The South Pacific region is vitally important for seabirds, yet their conservation is currently at a crossroads.¹ Human activities in the marine environment and its surroundings, including the South Pacific, have resulted in multiple threats to this group of birds.² The scientific literature for conserving seabirds has thus far, and continues to be, primarily focused on the biological dimensions, such as population dynamics, migration, feeding, and breeding ecology.³ In addition, research has been conducted to understand the threats driving their declines, as well as approaches to lessen them (e.g. by-catch mitigation, invasive species eradication).⁴ While addressing these knowledge gaps is essential to advancing the conservation of seabirds by informing management and policy decisions, researching the governance dimensions, in their own right, is also vitally important. After all, governance is the set of mechanisms that steers society to achieve collective action goals, such as conserving biodiversity, by enabling coordination and cooperation between actors.⁵ Accordingly, this chapter seeks to contribute to addressing this lacuna by identifying and analysing the inter-

1 CN Jenkins and K Van Houtan, 'Global and Regional Priorities for Marine Biodiversity Protection' (2016) 204 *Biological Conservation*: 333–339.

2 JP Croxall, SHM Butchart, B Lascelles, AJ Stattersfield, B Sullivan et al., 'Seabird Conservation Status, Threats and Priority Actions: A Global Assessment' (2012) 22 *Bird Conservation International* 1–34.

3 R Lewison, D Oro et al., 'Research Priorities for Seabirds: Improving Conservation and Management in the 21st Century' (2012) 17 *Endangered Species Research* 93–121.

4 MP Dias, R Martin, EJ Pearmain, IJ Burfield, C Small et al., 'Threats to Seabirds: A Global Assessment' (2019) 237 *Biological Conservation* 525–537; B Jones et al., 'Invasive Mammal Eradication on Islands Results in Substantial Conservation Gains' (2016) 113 *PNAS* 4033–4038; LS Bull, 'Reducing Seabird Bycatch in Longline, Trawl and Gillnet Fisheries' (2007) 8 *Fish and Fisheries* 31–56.

5 N Bennett and T Satterfield, 'Environmental Governance: A Practical Framework to Guide Design, Evaluation, and Analysis' (2018) 11 *Conservation Letters* 1–13.

national institutional framework relevant for seabird conservation in the South Pacific. This approach can potentially allow us to make recommendations based on identified gaps and strengths of such a framework.

Seabirds are found at various degrees of temporal and spatial overlap within the South Pacific, thereby warranting governance mechanisms that can overcome jurisdictional fragmentation. Ecologically, these birds take advantage of dispersed, patchy and ephemeral resources by undertaking movements at different temporal and spatial scales.⁶ In doing so, many of them cross political boundaries within the South Pacific and some go even beyond. Similarly, many of the threats facing seabirds are not limited to a single jurisdiction but operate at ocean-scale scales or along human-induced threat pathways. Some of the drivers of population declines, like the spread of invasive species, are permeable across international borders.⁷ In response, conserving seabirds necessitates high levels of coordination and cooperation among their respective range states,^{8,9} in this case, all national territories within the South Pacific. In this context, a full life-cycle approach is paramount to seabird conservation, which focuses on the need to consider all the demands of individual birds at all stages of their life-cycle essential for species persistence.¹⁰ The ‘flyway’ concept can be useful to operationalise such an approach, focusing on migratory birds,¹¹ as it seeks to define the resulting aggregations of overlapping migratory ranges.¹² Even though the flyway approach originated for waterfowl management,¹³ it has more recently been adopted for seabird conservation.¹⁴

- 6 JP Croxall (ed.) *Seabirds: Feeding Biology and Role in Marine Ecosystems* (Cambridge University Press, 1990).
- 7 D Simberloff, B Keitt, D Will, N Holmes, E Pickett and P. Genovesi, ‘Yes We Can! Exciting Progress and Prospects for Controlling Invasives on Islands and Beyond’ (2018) 78 *Western North American Naturalist* 942–958. For an overview of regulatory frameworks concerning invasive species, see Chapter 7 (Techera) in this volume.
- 8 PGR Jodice and RM Suryan, ‘The Transboundary Nature of Seabird Ecology’ in SC Trombulak and RF Baldwin (eds) *Landscape-scale Conservation Planning* (Springer Science+Business Media B.V., 2010) 139–165.
- 9 Range states are those states where migratory species breed, stop over, or rest and refuel at various stages of their life-cycle. The Convention on Migratory Species defines the term *range* as ‘all areas of land or water that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration route’.
- 10 CA Runge, TG Martin, HP Possingham, SG Willis and RA Fuller, ‘Conserving Mobile Species’ (2014) 12 *Frontiers in Ecology and the Environment* 395–402.
- 11 CA Galbraith, T Jones, J Kirby and T Mundkur, ‘A Review of Migratory Bird Flyways and Priorities for Management’ CMS Technical Series No. 27 (UNEP/CMS Secretariat, 2014).
- 12 GC Boere and DA Stroud, ‘The Flyway Concept: What It Is and What It Isn’t.’ in GC Boere, CA Galbraith, and DA Stroud (eds) *Waterbirds around the World* (The Stationery Office, 2006), 40–47.
- 13 AS Hawkins, RC Hanson, HK Nelson and HM Reeves (eds) *Flyways, Pioneering Waterfowl Management in North America* (The United States Department of Interior, Fish and Wildlife Service, 1984).
- 14 The East Asian–Australasian Flyway Partnership is a transboundary institutional arrangement adopting a flyway conservation approach, including seabirds. Available at: www.eaaflyway.net/migratory-waterbirds/.

Despite evidence for the existence of available governance mechanisms to conserve seabirds in the South Pacific,¹⁵ empirical analysis of the international institutional framework to conserve these species in the region is yet to be undertaken. Hence, the main aim of this chapter is to assess the potential of existing international institutional arrangements to enable the coordination and cooperation required to conserve seabirds in the region. In our research for this chapter, we sought to answer the following questions: (1) what are the international institutional arrangements potentially relevant for conserving seabirds in the South Pacific?; (2) who are the actors participating in this international institutional framework?; (3) how has such an international institutional framework emerged over time?; and (4) how well do existing arrangements match the conservation needs of seabirds in the region in relation to spatial scope and main threats?

This chapter is structured into five sections: (1) methods; (2) a brief review of the key concepts in governance and institutions; (3) the biological dimensions of seabirds; (4) a survey and analysis of the international institutional framework; and (5) concluding discussion. While this chapter focuses on international institutional arrangements relevant to seabird conservation in the South Pacific, there are, of course, many national and sub-national laws and policies relevant to seabird conservation. Hence, we encourage readers to complement this chapter by reference to other chapters in this collection where relevant, especially Techera's contribution on the domestic regulation of invasive species (Chapter 7) and Hamman and Jungblut's study on the protection of atolls, mangroves and coastal wetlands under domestic law (Chapter 9).

Methods

The institutional analysis presented in this chapter was based primarily on a literature review and desktop search using mixed methods with a focus on the South Pacific. Our scale of analysis was the South Pacific region, defined here as all tropical islands, reefs, atolls and waters within the exclusive economic zones from as far east as the Pitcairn Islands to as far west as Palau but excluding Hawaii. In addition, we also included all international waters (i.e. the High Seas) enclosed within neighbouring exclusive economic zones. Sources searched for relevant international institutional arrangements included the Pacific Islands Treaty Series,¹⁶ ECOLEX¹⁷ and the International Environmental Agreements Database Project.¹⁸ We considered membership of

15 BirdLife International, *Important Areas for Seabirds: Guiding Marine Conservation in the Pacific* (BirdLife International, 2012).

16 See www.pacii.org/pits/en/subject.shtml.

17 See www.ecolex.org.

18 See www.iea.uoregon.edu.

international institutional arrangements¹⁹ as either accession or ratification.²⁰ Our identification of institutional arrangements relevant to seabird conservation in the region was based on their provisions and programmatic activities in relation to the main threats affecting seabirds. Our empirical findings and conclusions have some limitations as we did not validate our data set and analysis through fieldwork (e.g. interviews, participant observation). Considering the logistical burden of research using field methods in an area as vast as the South Pacific, we envision the work presented in this chapter as an initial study potentially conducive to further research.

On governance and institutional arrangements

Governance refers to the collection of ideas, values, norms, mechanisms and institutional arrangements that help actors address collective action problems,²¹ such as seabird species conservation. The persistence of these animals presents interdependence of actors across vast areas, encompassing a variety of socio-economic, political and environmental contexts.²² Accordingly, institutional arrangements, understood as devised constraints to human interactions through agreed-upon rules and principles to achieve collective action goals,²³ have become the cornerstone for the conservation of biodiversity, including seabirds.²⁴ These arrangements are operationalised in practice through the development of document-based agreements between actors, such as the Convention on Biological Diversity and the Convention on Migratory Species. These arrangements involve actors across political jurisdictions, in this case, national, reducing uncertainties,²⁵ thus facilitating coordination and cooperation overcoming, at least in principle, the problem of jurisdictional fragmentation.²⁶ On the one hand, coordination is needed because conservation interventions within one jurisdiction may be undermined by threatening processes within another. On the other hand, cooperation allows capacity building and resource mobilisation because the demand for conservation interventions may not match capacity supply, as financial and technical

19 Membership to institutional arrangements was considered as at November 2019.

20 In this chapter, we have referred to both terms as accession for simplicity.

21 Bennett and Satterfield (n 5).

22 Jodice and Suryan (n 8).

23 DC North, *Institutions, Institutional Change and Economic Performance* (Cambridge University Press, 1990).

24 J Cooper, GB Baker, MC Double, R Gales, W Papworth et al., 'The Agreement on the Conservation of Albatrosses and Petrels: Rationale, History, Progress and the Way Forward' (2006) 34 *Marine Ornithology* 1–5.

25 North (n 23).

26 M Dallimer and N Strange, 'Why Socio-Political Borders and Boundaries Matter in Conservation' (2015) 30 *Trends in Ecology and Evolution* 132–139.

resources are usually unevenly distributed across the entire range of seabird species.²⁷

Seabirds: their biology, importance and conservation

Seabirds are a diverse group of species that rely heavily on marine environments and have had a close relationship with humans.²⁸ Globally, there are 359 species of seabirds representing 16 taxonomic families,²⁹ not all necessarily related to one another. Ecologically, seabirds can be broadly divided into ‘coastal’ and ‘pelagic’ species, with different movement patterns and life histories. An estimated 59 species from 8 families have ranges that wholly or substantially overlap with the South Pacific Islands and their surrounding oceanic waters (see Figures 6.1, 6.2 and Table 6.1).³⁰ This level of species richness places the South Pacific as one of the regions with highest seabird diversity in the world after New Zealand and south-eastern Australia. Within the South Pacific, Procellariidae is the most diverse family, containing 29 species occurring in the region. These birds are commonly known as the gadfly petrels and shearwaters. Seabirds have historically been, and continue to be, important to humans as they play key roles in marine, coastal and terrestrial ecosystems. For instance, they modulate prey populations and incorporate nutrients, such as nitrogen, into islands from the adjacent seas. Moreover, they have played an important role in human society, including as a food source, as cultural icons, as a source of fertiliser (i.e. guano) and as a navigational aid during early exploration and settlement of many South Pacific Islands.³¹

Seabirds have several biological and ecological characteristics that affect their conservation. While we cannot detail these in full, we highlight three that are particularly relevant to this chapter.³² First, seabirds primarily, and in many cases exclusively, acquire their food from the ocean where their diet includes fish, cephalopods (e.g. squid) and crustaceans (e.g. crabs). Because many of the prey consumed by seabirds are also highly valued by humans, this can bring seabirds into direct conflict and indirect competition with

27 S Wolf, B Keitt, A Aguirre-Muñoz, B Tershy, E Palacios and D Croll, ‘Transboundary Seabird Conservation in an Important North American Marine Ecoregion’ (2006) 33 *Environmental Conservation* 294–305.

28 Croxall et al. (n 2).

29 Dias et al. (n 4).

30 The list of species occurring in the South Pacific was compiled based on: D Onley and P Scofield, *Albatrosses, Petrels and Shearwaters of the World* (Princeton University Press, 2007); P Harrison, *Seabirds: An Identification Guide* (Houghton Mifflin, 1985); BirdLife International Datazone, available at: <http://datazone.birdlife.org/species/>. Taxonomy follows that adopted by BirdLife International.

31 A Crowe, *Pathway of the Birds: The Voyaging Achievements of Māori and Their Polynesian Ancestors* (Bateman Publishing, 2018).

32 For more information on the biology of seabirds, see EA Schreiber and J Burger, *Biology of Marine Birds* (CRC Press, 2001).

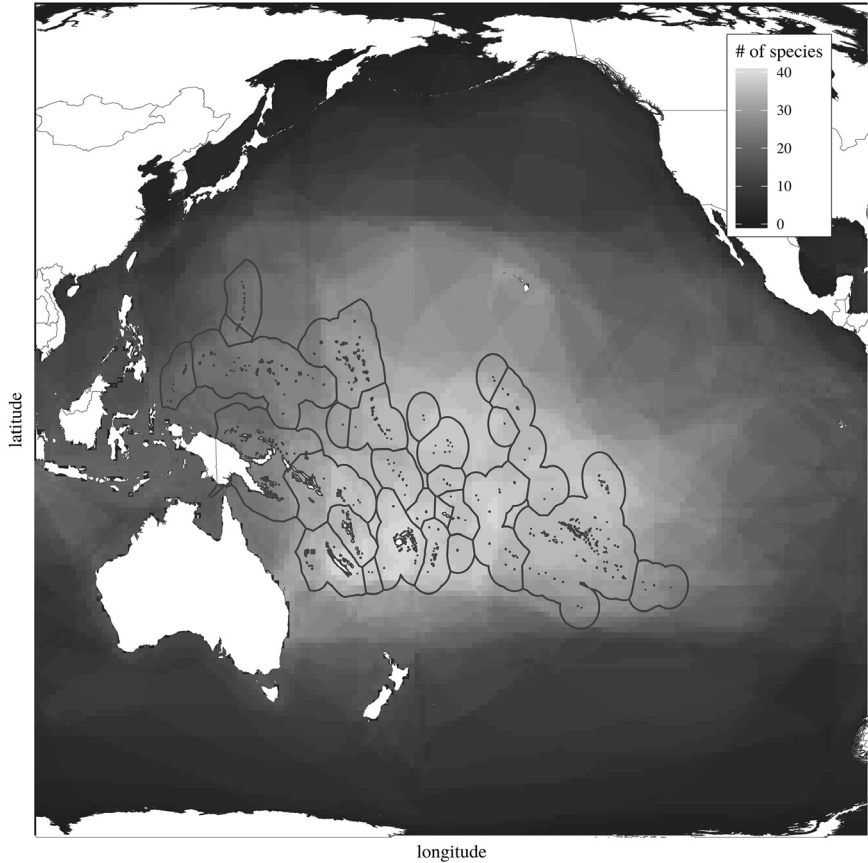


Figure 6.1 Distribution of the 59 seabird species whose ranges wholly or substantially overlap the South Pacific Islands and their surrounding waters.

Sources: BirdLife International and *Handbook of the Birds of the World* (2018). Bird species distribution maps of the world, available at: www.datazone.birdlife.org/species/; Flanders Marine Institute, 'Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM)', version 10 (2018). Available at: www.marineregions.org/.

Notes

Pixels are shaded according to the number of species that occur in the region year-round or seasonally based on species distribution maps from BirdLife International. Lines show the exclusive economic zones of the South Pacific Islands. Only species whose ranges substantially overlap the South Pacific Island countries and their exclusive economic zones are mapped; hence some places with high seabird diversity, such as New Zealand, appear as species poor because they do not share many species with the South Pacific Islands.

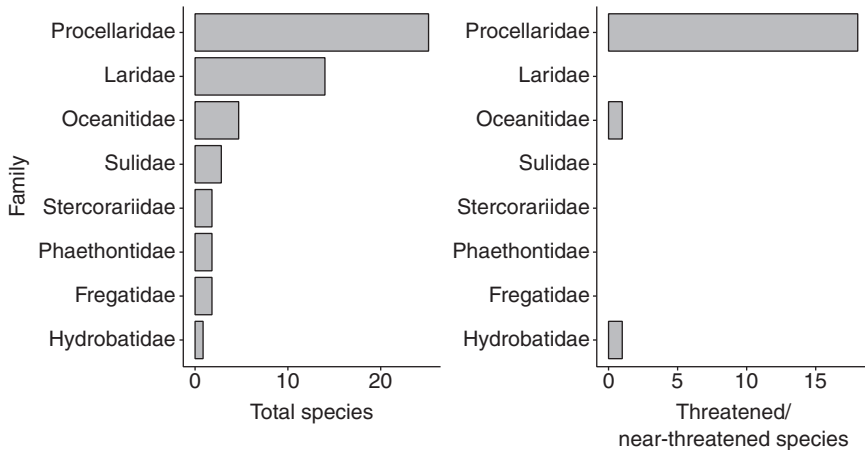


Figure 6.2 Species richness (left panel) and numbers of threatened or Near-Threatened seabird species (right panel) by family in the South Pacific Islands region.

Source: IUCN Red List of Threatened Species, version 2019-2. Available at: www.iucnredlist.org.

humans. For example, some seabird species follow fishing vessels in search of food, bringing them into direct contact with fishing gear, such as longlines with baited hooks and warp-towed trawl nets, which can result in bird mortality.³³ Similarly, overfishing can lead to the depletion of preferred prey sources of seabirds, as well as affect behavioural strategies for feeding. For instance, some seabirds are reliant on tuna shoals to locate their prey, so declines in tuna populations can have an indirect detrimental effect on these birds.³⁴

A second key consideration for seabird conservation is their breeding biology. While many seabirds spend the majority of their life at sea, they all must come ashore to reproduce, where they often nest in large colonies consisting of many thousands of individuals of sometimes multiple species. Nesting habits of seabirds are as diverse as the species themselves, with some forming nests that are merely scrapes on bare ground, others constructing nests in small shrubs and trees, and some nesting in underground burrows. However, perhaps the most critical element of seabird breeding biology is where they breed. Seabirds have evolved in large part to breed on isolated

33 C Pott and DA Weidenfeld, 'Information Gaps Limit Our Understanding of Seabird By-Catch in Global Fisheries' (2017) 210 *Biological Conservation* 192–204.

34 Croxall et al. (n 2).

Table 6.1 Seabird species occurring in the South Pacific region and their global conservation status

Family	Species	English name	IUCN conservation status ¹
Phaethontidae	<i>Phaethon rubricauda</i>	Red-tailed Tropicbird	LC
Phaethontidae	<i>Phaethon lepturus</i>	White-tailed Tropicbird	LC
Oceanitidae	<i>Oceanites oceanicus</i>	Wilson's Storm-petrel	LC
Oceanitidae	<i>Pelagodroma marina</i>	White-faced Storm-petrel	LC
Oceanitidae	<i>Fregatta grallaria</i>	White-bellied Storm-petrel	LC
Oceanitidae	<i>Fregatta tropica</i>	Black-bellied Storm-petrel	LC
Oceanitidae	<i>Nesofregatta fuliginosa</i>	Polynesian [White-throated] Storm-petrel	EN
Hydrobatidae	<i>Hydrobates matsudairae</i>	Matsudaira's Storm-petrel	VU
Procellariidae	<i>Pterodroma leucoptera</i>	White-winged [Gould's] Petrel	VU
Procellariidae	<i>Pterodroma brevipes</i>	Collared Petrel	VU
Procellariidae	<i>Pterodroma cookii</i>	Cook's Petrel	VU
Procellariidae	<i>Pterodroma pycrofti</i>	Pycroft's Petrel	VU
Procellariidae	<i>Pterodroma nigripennis</i>	Black-winged Petrel	LC
Procellariidae	<i>Pterodroma ultima</i>	Murphy's Petrel	LC
Procellariidae	<i>Pterodroma solandri</i>	Providence Petrel	VU
Procellariidae	<i>Pterodroma neglecta</i>	Kermadec Petrel	LC
Procellariidae	<i>Pterodroma heraldica</i>	Herald Petrel	LC
Procellariidae	<i>Pterodroma atrata</i>	Henderson Petrel	EN
Procellariidae	<i>Pterodroma alba</i>	Phoenix Petrel	EN
Procellariidae	<i>Pterodroma inexpectata</i>	Mottled Petrel	NT
Procellariidae	<i>Pterodroma cervicalis</i>	White-necked Petrel	VU
Procellariidae	<i>Procellaria parkinsoni</i>	Black [Parkinson's] Petrel	VU
Procellariidae	<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	LC
Procellariidae	<i>Ardenna bulleri</i>	Buller's Shearwater	VU
Procellariidae	<i>Ardenna tenuirostris</i>	Short-tailed Shearwater	LC
Procellariidae	<i>Ardenna grisea</i>	Sooty Shearwater	NT
Procellariidae	<i>Ardenna carneipes</i>	Flesh-footed Shearwater	NT
Procellariidae	<i>Calonectris leucomelas</i>	Streaked Shearwater	NT
Procellariidae	<i>Puffinus nativitatis</i>	Christmas Shearwater	LC
Procellariidae	<i>Puffinus myrtae</i>	Rapa Shearwater	CR
Procellariidae	<i>Puffinus bailloni</i>	Tropical Shearwater	LC
Procellariidae	<i>Puffinus assimilis</i>	Little Shearwater	LC
Procellariidae	<i>Puffinus heinrothi</i>	Heinroth's Shearwater	VU
Procellariidae	<i>Pseudobulweria macgillivrayi</i>	Macgillivray's [Fiji] Petrel	CR
Procellariidae	<i>Pseudobulweria becki</i>	Beck's Petrel	CR
Procellariidae	<i>Pseudobulweria rostrata</i>	Tahiti Petrel	NT
Procellariidae	<i>Bulweria bulwerii</i>	Bulwer's Petrel	LC
Fregatidae	<i>Fregata ariel</i>	Lesser Frigatebird	LC
Fregatidae	<i>Fregata minor</i>	Great Frigatebird	LC
Sulidae	<i>Sula sula</i>	Red-footed Booby	LC
Sulidae	<i>Sula leucogaster</i>	Brown Booby	LC

Family	Species	English name	IUCN conservation status ¹
Sulidae	<i>Sula dactylatra</i>	Masked Booby	LC
Laridae	<i>Anous stolidus</i>	Brown Noddy	LC
Laridae	<i>Anous minutus</i>	Black Noddy	LC
Laridae	<i>Anous albivittus</i>	Grey Noddy	LC
Laridae	<i>Gygis alba</i>	White Tern	LC
Laridae	<i>Larus novaehollandiae</i>	Silver Gull	LC
Laridae	<i>Onychoprion fuscatus</i>	Sooty Tern	LC
Laridae	<i>Onychoprion anaethetus</i>	Bridled Tern	LC
Laridae	<i>Onychoprion lunatus</i>	Grey-backed Tern	LC
Laridae	<i>Sternula albifrons</i>	Little Tern	LC
Laridae	<i>Gelochelidon nilotica</i>	Common Gull-billed Tern	LC
Laridae	<i>Chlidonias hybrida</i>	Whiskered Tern	LC
Laridae	<i>Sterna dougallii</i>	Roseate Tern	LC
Laridae	<i>Sterna sumatrana</i>	Black-naped Tern	LC
Laridae	<i>Thalasseus bengalensis</i>	Lesser crested Tern	LC
Laridae	<i>Thalasseus bergii</i>	Crested Tern	LC
Stercorariidae	<i>Stercorarius parasiticus</i>	Arctic Skua	LC
Stercorariidae	<i>Stercorarius pomarinus</i>	Pomarine Skua	LC

Note

1 Based on latest assessments as at 2019 by the International Union for Conservation of Nature. Conservation categories (IUCN): LC (Least Concern), NT (Near-Threatened), VU (Vulnerable), EN (Endangered), and CR (Critically Endangered).

islands, including low-lying atolls.³⁵ Consequently, many species are ill-equipped to defend themselves against novel predators and pests, meaning the arrival of humans with invasive non-native species, such as rats (*Rattus spp.*) and cats (*Felis catus*), to previously isolated islands can have devastating consequences for seabird populations.³⁶ Furthermore, impact on their reproduction is exacerbated in pelagic species, as they are slow breeders, producing only one chick annually and presenting delayed sexual maturity.³⁷

A third important feature is the scale of seabird movements, which varies widely both across species and seasonally within species. For example, the range of the Sooty Shearwater (*Ardenna grisea*) encompasses much of the Pacific and Southern Oceans, whereas the Fiji Petrel (*Pseudobulweria macgillivrayi*) and Heinroth's Shearwater (*Puffinus heinrothi*) occur chiefly within the

35 These low-lying islands may be considered 'wetlands', and indeed many may qualify for Ramsar site status. See the discussion in Chapter 9 of this collection (Hamman and Jungblut).

36 Schreiber and Burger (n 32).

37 Ibid.

exclusive economic zone of one and two South Pacific Island countries, respectively. Likewise, a given species may make relatively short-distance foraging trips from colonies during the breeding season but travel much further in search of productive foraging grounds during the non-breeding season. Understanding the scale at which seabirds undertake movements is essential for their conservation because it provides insights into the extent to which threats operate regionally within the South Pacific or elsewhere, in the case of wide-ranging species. In turn, considering how threats operate at different places is essential to devise the scale of cooperation and coordination needed between countries for ensuring species conservation.³⁸

Threats contributing to the endangerment of seabird species globally and in the South Pacific are wide-ranging and diverse, impacting individuals and populations throughout their life-cycle, including while at sea and in breeding colonies. Globally, invasive non-native species, fisheries by-catch, hunting and trapping, as well as climate change and severe weather have been identified as threats impacting the most species (≥ 25 per cent of 359 species), with disturbance, pollution, overfishing and problematic native species all impacting 10–20 per cent of species.³⁹ Invasive non-native species, fisheries by-catch, and climate change are also among the top threats as measured by average impact, along with overfishing.⁴⁰ A similar suite of threats emerges when considering the species that occur wholly or partially in the South Pacific region. Based on threat data available for 57 species from the IUCN Red List of Threatened Species,⁴¹ invasive non-native species threaten the most species (72 per cent), followed by biological resource use (53 per cent; this includes indirect and direct mortality through hunting, by-catch and overfishing of prey), as well as climate change and severe weather (39 per cent). Concerningly, the percentage of seabird species of the South Pacific Islands threatened by invasive non-native species is considerably higher than the global average.⁴² Indeed, invasive non-native species are considered an ongoing threat to all but one of the 21 Near-Threatened and threatened species of the region. Other ongoing but generally less severe threats to seabirds in the region include pollution (e.g. light pollution, marine debris), human disturbance (e.g. from recreational activities), and development.⁴³ Additionally, historical threats to seabirds include nuclear testing, phosphate (i.e. guano) mining and drift net fishing (see Box 6.1). While we do not consider historical threats as part of our institutional analysis, it is important to acknowledge them as they could resume in the future. In all, 21 of the 59 species occurring in the South Pacific are listed as Near-Threatened and

38 Wolf et al. (n 27).

39 Dias et al. (n 4).

40 Ibid.

41 IUCN Red List of Threatened Species, version 2019-2. Available at: www.iucnredlist.org

42 Dias et al. (n 4).

43 IUCN (n 41).

threatened by the International Union for Conservation of Nature (IUCN; Figure 6.2).⁴⁴ The Beck's Petrel (*Pseudobulweria becki*; Critically Endangered), Fiji Petrel (*P. macgillivrayi*; Critically Endangered), Rapa Shearwater (*Puffinus myrtae*; Critically Endangered), Henderson Petrel (*Pterodroma atrata*; Endangered), Phoenix Petrel (*P. alba*; Endangered) and Polynesian Storm-petrel (*Nesofregetta fuliginosa*; Endangered) are the most highly threatened of the species in the region and all six species have ranges that are restricted almost entirely to the South Pacific Islands and their surrounding waters. This combination of species richness and threats makes the South Pacific region a global priority for seabird conservation.⁴⁵

Box 6.1 Regulating drift nets in the Pacific

The phasing-out and ban of drift net fishing in the South Pacific can be traced back to international institutional arrangements. Drift net fishing had expanded rapidly throughout this region in the 1980s, creating concerns due to its capacity to overexploit target species and its low selectivity,⁴⁶ including seabird by-catch.⁴⁷ The Tarawa Declaration was the first response to this threat, emerging in an international context under the Pacific Islands Forum, then the South Pacific Forum.⁴⁸ This pledge was followed by the negotiation of the Convention for the Prohibition of Fishing with Long Driftnets in the South Pacific, known as the Wellington Convention, developed in 1989. This institutional arrangement covers most of the South Pacific, including international waters and those under the jurisdiction of contracting parties, which includes 11 countries with territories in the South Pacific, as defined in this chapter.⁴⁹

Monitoring and research are essential to guide the conservation of seabirds, but knowledge gaps remain within the region. First, population monitoring is necessary to track trends and avert extinctions, however, it is estimated only 12 per cent of the breeding population of all seabird species combined has been monitored within the South Pacific region.⁵⁰ Second, understanding the scale of seabird movements is key to understanding how different threats

44 Ibid.

45 Jenkins and Van Houtan (n 1).

46 MR Islam, 'The Proposed "Driftnet-Free Zone" in the South Pacific and the Law of the Sea Convention' (1991) 40 *International & Comparative Law Quarterly* 184–198.

47 S Uhlmann, D Fletcher, and H Moller, 'Estimating Incidental Takes of Shearwaters in Driftnet Fisheries: Lessons for the Conservation of Seabirds' (2005) 123 *Biological Conservation* 151–163.

48 See www.forumsec.org/tarawa-declaration/.

49 See www.ecolex.org/details/treaty/convention-for-the-prohibition-of-fishing-with-long-driftnets-in-the-south-pacific-tre-001043/.

50 M Paleczny, E Hammill, V Karpouzi, and D Pauly, 'Population Trend of the World's Monitored Seabirds, 1950–2010' (2015) 10 *PLoS ONE* e0129342.

impact upon their populations. In this context, miniaturisation of tracking technology has filled important knowledge gaps on movements, including feeding and breeding areas, as well as the timing of migration.⁵¹ However, there is still a need for more spatially explicit analysis of seabird movements that can be used to underpin systematic conservation planning within the scope of international institutional arrangements.⁵² Those two parameters, population size and movements, are very important to guide conservation. As an example, for species whose range is wholly or largely contained within the South Pacific, including the six most highly threatened species, changes in their distribution and abundance can be largely attributed to environmental, demographic and threatening processes acting in the region. However, changes in the distribution and abundance of species with wider movements could be due to processes occurring both inside and outside the South Pacific. Therefore, detailed and coordinated studies of the exact types, locations and relative magnitudes of threats within and across islands, coupled with consideration of species movements, are needed to prioritise conservation efforts. While progress has been made on this front, monitoring and researching seabirds are logistically challenging endeavours as birds spend most of their time either at sea or on oftentimes remote oceanic islands.⁵³

Survey and analysis of the international institutional framework

As noted above, conserving seabirds across the South Pacific relies upon multiple international institutional arrangements with various degrees of functional, spatial, and jurisdictional overlap. For the purpose of the institutional analysis set out below, we selected invasive species, habitat loss, hunting and fisheries by-catch as the main threats to seabirds occurring in the South Pacific, based on the previous section. Other threats were excluded because their mitigation requires either coordination and cooperation at a global scale (e.g. climate change) or because there is limited evidence about their impact in the region (e.g. light pollution).⁵⁴ In this context, we identified 11 international institutional arrangements, ten (i.e. 91 per cent) of them legally binding, that collectively address, at least prescriptively, the main threats to seabirds within the South Pacific (Table 6.2). This set of instruments can be considered as the ‘core framework’ at our scale of analysis, noting that we did not take on a full life-cycle approach for all species. The core framework is

51 A Rodriguez, JM Arcos et al. ‘Future Directions in Conservation Research on Petrels and Shearwaters’ (2019) 6 *Frontiers in Marine Science* 94.

52 DC Dunn, AL Harrison et al. ‘The Importance of Migratory Connectivity for Global Ocean Policy’ (2019) 286 *Proceedings of the Royal Society of London B* 20191472.

53 Rodriguez et al. (n 51).

54 BirdLife International (n 15).

Table 6.2 Core international institutional arrangements of the framework for conserving seabirds in the South Pacific with their parties, relative importance score, and provisions/threats

Institutional arrangement	Type*	Parties	Relative importance score	Provisions/threats				
				Hunting	By-catch	Invasive species	Habitat (marine)**	Habitat (terrestrial)**
1. Ramsar Convention	Global MEA ¹	11	22	No	No	Yes	Yes	No
2. Convention on Migratory Species	Global MEA ¹	6	30	Yes	Yes	Yes	Yes	Yes
3. Convention on Biological Diversity	Global MEA ¹	16	64	Yes	No	Yes	Yes	Yes
4. World Heritage Convention	Global MEA ¹	15	45	No	No	Yes	Yes	Yes
5. International Tropical Timber Agreement	Global MEA ¹	2	2	No	No	No	No	Yes
6. Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (Noumea Convention)	Regional MEA ¹	11	33	Yes	No	No	Yes	Yes
7. Pacific Regional Environment Programme	Regional MEA ¹	18	72	No	Yes	Yes	Yes	Yes
8. Pacific Islands Forum	Regional MEA ¹	16	32	No	Yes	No	Yes	No
9. Coral Triangle Initiative	Regional MEA ²	2	8	No	Yes	Yes	Yes	Yes
10. Western and Central Pacific Fisheries Commission	Regional FA ¹	17	17	No	Yes	No	No	No
11. South Pacific Regional Fisheries Management Organisation	Regional FA ¹	2	2	No	Yes	No	No	No

Notes

1 Legally binding.

2 Non-legally binding.

* Global MEA: global multilateral environmental agreement; Regional MEA: regional multilateral environmental agreement; Regional FA: regional fisheries agreement.

** Provisions for the designation of protected areas.

composed of global and regional arrangements with various degrees of spatial overlap with the South Pacific. For instance, while the Convention for the Protection of Natural Resources and Environment of the South Pacific Region (the Noumea Convention) is restricted to the region, the Western and Central Pacific Fisheries Commission spans widely north and south. In addition to this core, the framework includes spatially non-overlapping institutional arrangements with which some of the instruments within the core framework formally interact. It seems clear that the international institutional framework for conserving seabirds within the South Pacific is marked by complexity (Figure 6.3).

The international institutional framework for conserving seabirds in the region presents various temporal, political, and functional patterns. Membership of the international institutional arrangements within the core framework started emerging in the early 1970s, with two periods of more intense treaty-making, or accessions, one in the early 1990s and another in the early 2000s. The treaty-making process, or accessions to existing arrangements, seems to have generally plateaued since 2014 (Figure 6.4). Regarding membership of the institutional arrangements from the core framework, three countries are members of most of them (upper quartile > 7), namely Cook Islands, Fiji and Papua New Guinea, while four countries have the lowest membership within the core framework (lower quartile < 5), namely Tokelau, Tuvalu, the United States and the United Kingdom. When considering provisions as rules relevant to addressing threats to seabirds, habitat protection in the marine and terrestrial realms presents the highest level of membership, followed by invasive species. Conversely, the threats with lowest membership are hunting and fisheries by-catch (Table 6.3).

The international institutional arrangements could be considered as having various levels of relative importance for seabird conservation. To assess their relative importance,⁵⁵ we calculated 'a score' for each of them as the product of the number of signatory countries and relevant provisions based on the main threats considered by our institutional analysis (i.e. invasive species, habitat loss, hunting, and fisheries by-catch). In this context, the Pacific Regional Environment Programme has the highest score, followed by the Convention on Biological Diversity and the World Heritage Convention (upper quartile > 39). Conversely, the International Tropical Timber Agreement, the Coral Triangle Initiative, the South Pacific Regional Fisheries Management Organisation and the Western and Central Pacific Fisheries Commission present the lowest score (lower quartile < 13.5). Examples of international institutional arrangements with intermediate scores include the Ramsar Convention on Wetlands and the Convention on Migratory Species.

55 This relative importance does not consider the effectiveness of individual institutional arrangements in terms of implementation, which was beyond the scope of our research.

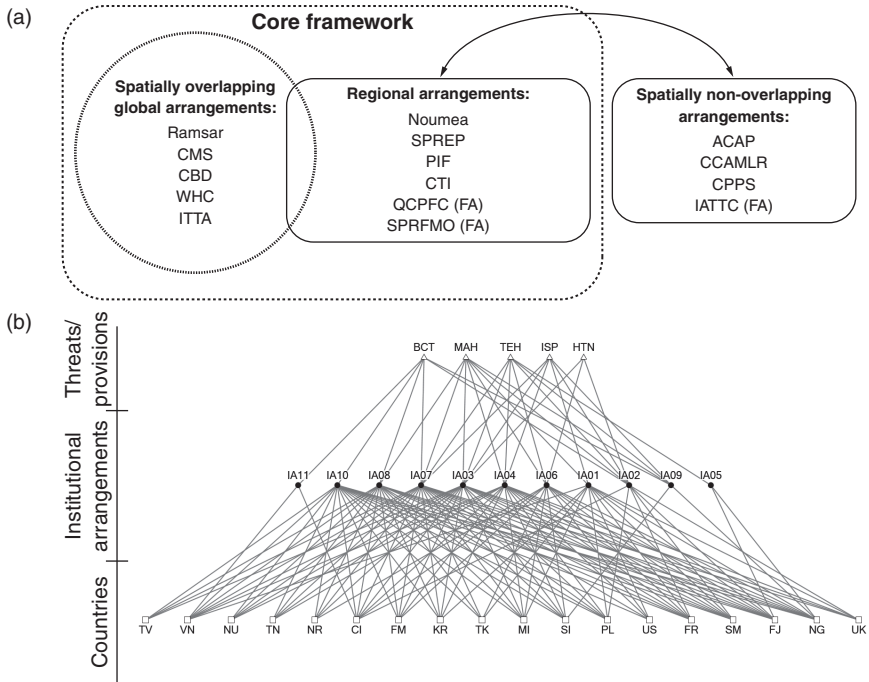


Figure 6.3 (a) International institutional framework for conserving seabirds in the South Pacific; (b) network representation of the core international institutional framework including threats/provisions, institutional arrangements, and country members.

Notes

(a) Core framework arrangements: Ramsar (Ramsar Convention), CMS (Convention on Migratory Species), CBD (Convention on Biological Diversity), WHC (World Heritage Convention), ITTA (International Tropical Timber Agreement), Noumea (Noumea Convention), PREP (Pacific Regional Environment Programme), PIF (Pacific Islands Forum), CTI (Coral Triangle Initiative), WCPFC (Western and Central Pacific Fisheries Commission), FA (fisheries-focused arrangement), SPRFMO (South Pacific Regional Fisheries Management Organisation). Non-overlapping arrangements: ACAP (Agreement on the Conservation of Albatrosses and Petrels), CCAMLR (Convention for the Conservation of Antarctic Marine Living Resources), CPPS (Permanent Commission for the South Pacific), IATTC (Inter-American Tropical Tuna Commission). (b) Threats/provisions: BCT (fisheries by-catch), MAH (marine habitat conservation), TEH (terrestrial habitat conservation), ISP (invasive species), HTN (hunting). Institutional arrangements: IA01 (Ramsar), IA02 (CMS), IA03 (CBD), IA04 (WHC), IA05 (ITTA), IA06 (Noumea), IA07 (PREP), IA08 (PIF), IA09 (CTI), IA10 (WCPFC), IA11 (SPRFMO). Countries: TV (Tuvalu), VN (Vanuatu), NU (Niue), TN (Tonga), NR (Nauru), CI (Cook Islands), FM (Federated States of Micronesia), KR (Kiribati), TK (Tokelau), MI (Marshall Islands), SI (Solomon Islands), PL (Palau), US (United States of America), FR (France), SM (Samoa), FJ (Fiji), NG (Papua New Guinea), UK (United Kingdom).

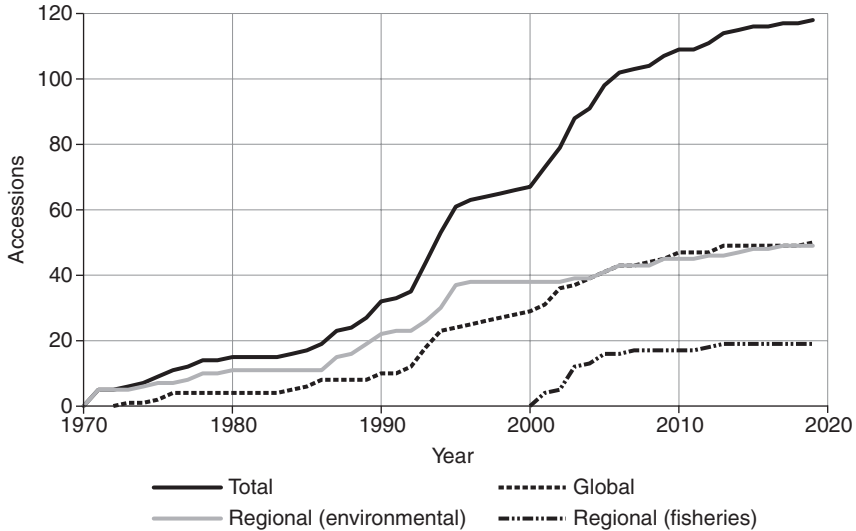


Figure 6.4 Temporal emergence of the core international institutional framework for conserving seabirds in the South Pacific.

Notes

Total: accessions to all relevant international institutional arrangements; global: accessions to global international institutional arrangements; regional (environmental): accessions to regional international institutional arrangements with a broad environmental focus; regional (fisheries): accessions to regional international institutional arrangements with a focus on fisheries.

Regardless of their relative importance, the lack of international institutional arrangements focused specifically on bird conservation is notable.

Threats as considered by the international institutional framework

Invasive species

The management and eradication of invasive species threatening seabirds require a coordinated and collaborative approach at a regional level. Invasive species, such as rats (*Rattus spp.*), feral cats (*Felis catus*) and the small Indian mongoose (*Herpestes auro-punctatus*), affect seabirds by preying on chicks and adults during their breeding season on islands in the South Pacific. In addition, other invasive species, such as goats (*Capra hircus*), impact seabirds by trampling on otherwise suitable nesting habitat. As a response to this threat, coordination between countries is required to avoid both the further spread of invasive species, as well as reintroductions on islands where their eradication has been successful. This strategy requires the harmonisation of bio-security protocols across countries, and possibly the introduction of ‘model

Table 6.3 Coverage measured as membership of core international institutional arrangements for conserving seabirds in the South Pacific as a function of country members and provisions

Signatory state	Threats/provisions				Total accessions		
	Hunting	By-catch	Invasive species	Habitat (marine)	Habitat (terrestrial)		
Cook Islands	3	2	4	6	5		8
Fiji	3	1	5	7	7		8
France ¹	3	1	5	7	6		7
Kiribati	1	1	4	5	4		5
Marshall Islands	2	1	4	6	5		6
Micronesia	2	1	3	5	4		6
Nauru	2	1	2	4	3		5
Niue	1	1	3	4	3		5
Palau	2	1	5	6	5		6
Papua New Guinea	2	2	5	7	7		8
Samoa	3	1	5	7	6		7
Tokelau ²	1	1	2	4	3		4
Solomon Islands	2	2	4	6	5		7
Tonga	1	1	3	4	3		5
Tuvalu	1	1	2	3	2		4
UK ³	2	0	5	5	5		4
USA ⁴	1	1	3	4	4		4
Vanuatu	1	2	4	4	4		7
Mean (±SD)	1.83 (±0.76)	1.16 (±0.50)	3.77 (±1.08)	5.22 (±1.27)	4.5 (±1.38)		5.88 (±1.41)

Notes

1 French Polynesia/New Caledonia/Wallis and Futuna.

2 Sometimes signed by New Zealand, sometimes directly.

3 Pitcairn Islands.

4 American Samoa/Guam/Howland and Baker Islands/Jarvis Island/Northern Mariana Islands/Palmyra Atoll.

laws' (as Techera discusses in Chapter 7). Cooperation is also needed as some countries in the region lack financial and technical capacity to execute on-the-ground work for the management of invasive species.⁵⁶ Technical and financial assistance is very important for successful management and possible eradication, as invasive species require resource-heavy and science-based approaches. For instance, eradication can involve the use of aircraft to deploy bait, as well as on-the-ground actions implemented in tandem, such as trapping. Addressing this threat is particularly important for tube-nosed seabirds (i.e. petrels and shearwaters; Procellariidae) breeding within the South Pacific region, as they are slow breeders and their breeding colonies are restricted to only a few islands.

We identified four global and two regional arrangements as having provisions, decisions, and programmatic activities to deal with invasive species in the terrestrial realm. However, two of the global arrangements, namely the World Heritage Convention and the Ramsar Convention, are site-based instruments. Accordingly, those two are adequate to guide the management of invasive species at specific sites but are generally insufficient to develop a region-wide approach to manage invasive species with a focus on seabird conservation. Furthermore, the Convention on Biological Diversity is perhaps too generic for this purpose, while the Convention on Migratory Species and the Coral Triangle Initiative have low membership within the South Pacific, limiting their reach. Conversely, the Pacific Regional Environment Programme, which has full membership in the region, has been actively developing a regional approach to invasive species management, which has included policy instruments (i.e. the Guidelines for Invasive Species Management in the Pacific), knowledge sharing, and capacity building (i.e. the Pacific Invasives Partnership), as well as monitoring and data sharing (i.e. the Pacific Invasive Species Reporting Database).⁵⁷ Hence, while global conventions do play a role within the region, they could be considered supporting instruments to implement and strengthen the coordinating role of the Pacific Regional Environment Programme.

Habitat loss

Although the designation of protected areas is likely not enough on its own to conserve seabirds in the region, it is an important conservation tool to guard against threats at critical stages of their life-cycle. Seabirds are generally

56 Pacific Invasives Initiative, 'Invasive Species Management in the Pacific: A Review of National Plans and Current Activities' (2010). Unpublished report for the Pacific Invasives Partnership by Natasha Doherty and Souad Boudjelas. Pacific Invasives Initiative. Auckland, New Zealand.

57 Details of the regional approach to invasive species management under the Pacific Regional Environment Programme as well as other invasive management initiatives at the local and regional level are discussed by Techera in Chapter 7.

wide-ranging animals, so protecting the entire spatial scope of their activities through protected areas is almost impossible. Instead, their conservation requires accounting for additional management strategies to minimise anthropogenic impacts in areas of high overlap between seabird species and exploitation of natural resources by humans, such as the case of by-catch mitigation measures in fishing areas. However, critical stages of these species' life-cycle, such as breeding or migration, may require more stringent conservation approaches, including protected areas. For instance, stops while on migration result in high concentrations of individuals within short periods of time, in which human activities could potentially lead to high mortality levels (e.g. fisheries by-catch). In addition, protected areas can help prevent overfishing, guarding seabirds from the impact of prey depletion. Human pressures at breeding sites, such as urbanisation, disturbance, and mining (discussed by Hamman, Jaeckel and Aonima in Chapter 8), can reduce the long-term viability of populations altogether. It is precisely at these different stages of a seabird's life-cycle that protected areas can play a key role in their conservation. For the purpose of our institutional analysis in this chapter, we focus exclusively on protected areas as provisions to address habitat loss. In all, the designation of protected areas needs to account for the movements of individual birds within populations, as failing to protect key sites may result in conservation measures elsewhere being undermined.

We identified nine institutional arrangements with relevance to habitat conservation for seabirds, five of them are global and four are regional. Some of the global arrangements are site-focused, such as the Ramsar Convention and the World Heritage Convention.⁵⁸ Conversely, others are more general in their prescriptions regarding the establishment of protected areas for seabirds but nevertheless relevant, such as the Convention on Biological Diversity and the Convention on Migratory Species. Interestingly, the International Tropical Timber Agreement⁵⁹ is important as it focuses on sustainable logging in tropical forests, including the prevention of illegal logging. Even though there are only two members in the South Pacific region, namely, Fiji and Papua New Guinea, this agreement could potentially be relevant for the conservation of at least three threatened species that nest on forested mountains. That is the case of Beck's Petrel (*Pseudobulweria beeki*) and Heinroth's Shearwater (*Puffinus heinrothi*), both thought to breed in New Ireland and Bougainville (Papua New Guinea), respectively, as well as the Fiji Petrel (*P. macgillivrayi*), which breeds on Gau Island (Fiji). Additionally, the four regional arrangements have provisions and programmatic activities for habitat

58 For examples of the application of the Ramsar Convention and the World Heritage Convention for establishing protected areas, see Chapters 9 and 10 respectively.

59 For information on the ITTA framework, see K Houghton and H Naughton, 'Trade and Sustainability: The Impact of the International Tropical Timber Agreements on Exports' (2017) 17 *International Environmental Agreements: Politics, Law and Economics* 755–778.

conservation in either the marine realm or both the marine and terrestrial realms. Examples are the Framework for a Pacific Oceanscape, developed under the Pacific Islands Forum and the Framework for Nature Conservation and Protected Areas in the Pacific Islands Region, developed under the Pacific Regional Environment Programme. Finally, the only regional institutional arrangement with a specific plan for seabird conservation, the Coral Triangle Initiative, has only two members in the region, namely Papua New Guinea and Solomon Islands.

Hunting

Hunting requires coordination and cooperation across the region due to cumulative impacts. From a harvesting standpoint, seabirds can be considered common-pool resources, because they are rivalrous and non-excludable.⁶⁰ In other words, access to seabirds as quarry precludes other users from having access to the same resource (i.e. because they are killed). Likewise, excluding potential hunters targeting seabirds is challenging as many of these birds are found freely over vast areas. Hence, sustainable hunting of seabirds needs to account for whole populations, as hunting across their entire ranges presents a cumulative impact. At the same time, approaches need to be sensitive to local island communities who may rely heavily upon seabirds and their eggs for subsistence and cultural practices. In any event, institutional arrangements that enable coordination ensuring population-level take is not exceeded are paramount, which requires harmonisation of domestic policy across all range states. In addition to coordination, cooperation is also needed to address the sustainable harvest of seabirds, either to assist countries with low capacity for developing and implementing domestic policies or to ensure hunting management measures in one country do not have unintended consequences in others. In the need for coordination and cooperation for seabird harvest management across countries, it is important to highlight how countries may hold different views on hunting which can stall negotiations and the development of effective arrangements.

Within the South Pacific region, hunting is covered by three international institutional arrangements. Two of these are global instruments, namely the Convention on Biological Diversity and the Convention on Migratory Species, while one is regional in scope, the Noumea Convention. Even though they all have large memberships and provisions that could ensure the harvest of seabirds is sustainable in the region, they seemingly have no more specific policy guidance to ensure this goal is realised. Notably, the Agreement on the Conservation of Albatrosses and Petrels, a subsidiary agreement to the Convention on Migratory Species that provides

60 E Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press, 1990).

a more focused framework for seabird conservation, does not have any range states within the South Pacific. This gap is exacerbated by a general lack of research and monitoring on hunting of seabirds, as there is scant data on the actual levels of harvest, the species taken, as well as their socio-economic drivers (Box 6.2).

Box 6.2 Hunting of noddies in Nauru

The hunting of noddy terns (*Anous spp.*) has a long history in the Pacific, as showcased by anecdotal accounts from Nauru as follows:

Noddy birds [terns], a local [Nauruan] delicacy that in the past was targeted only on ceremonial occasions, are now caught in large numbers on a daily basis for food and income. Every evening men go out in groups to catch birds in the pinnacles in the mined-out areas in the middle of the island. Catches are between 40 and 60 birds per group of 5–6 men; some groups catch up to 100 birds a night. The birds are sold at \$1.00 each.⁶¹

Hunting, alongside loss of nesting habitat due to phosphate mining (discussed in Chapter 8), have likely been drivers of population declines of this species in Nauru.⁶²

Fisheries by-catch

Given their foraging activities in the open ocean, seabirds are susceptible to by-catch or ‘incidental take’ from fisheries in the region. By-catch of seabirds by commercial fishing operations can be considered, in economic terms, as a ‘negative externality’. This source of seabird mortality has started to be addressed more recently around the world, including the South Pacific. Incidental mortality of seabirds has been documented in multiple types of fishing gear, many of which operate within the region, such as longlining, trawling, and purse seining.⁶³ Solutions to reduce mortality from fishing are primarily aimed at reducing the attractiveness of fishing operations to seabirds and excluding them from interacting with fishing gear. Hence, solutions for longlining include deployment of hooks using techniques that make bait unavailable to seabirds, as birds most likely drown if hooked. Mitigation for trawling includes retention of discards and use of scaring devices that deter the birds approaching the stern of the vessels, where warp cables towing the

61 A Vunisea, ‘Fishing to Sustain Livelihoods in Nauru’ (2007) 22 *Women in Fisheries* at 22.

62 DW Buden, ‘The Birds of Nauru’ (2008) 55 *Notornis* 8–19, at 13.

63 Dias et al. (n 4); A Hedde, PM Regular, SI Wilhelm, JF Rail, B Drolet et al., ‘Characterization of Seabird By-Catch in Eastern Canadian Waters, 1998–2011, Assessed from Onboard Fisheries Observer Data’ (2016) 26 *Aquatic Conservation: Marine and Freshwater Ecosystems* 530–548.

net become a collision risk. Finally, purse seining requires temporal and spatial closures, as well as procedures during the fishing operations that reduce the slack of the nets, which make them more prone to entangle birds. In all cases, addressing seabird mortality from by-catch requires a coordinated approach across jurisdictions, including for data collection and monitoring. The aim should be that effective measures can be adopted in practice across multiple types of fishing gear, accounting for cumulative effects upon seabird populations, spanning multiple political jurisdictions. Likewise, cooperation is needed for resource mobilisation and technology transfer, particularly as solutions and lessons can be diffused from one fishery to another one.

There are six international institutional arrangements relevant to addressing fisheries by-catch within the South Pacific (see Table 6.2). Among them, there are two regional fisheries-focused institutional arrangements worth considering in detail. The Western and Central Pacific Fisheries Commission has been working on strategies to address seabird by-catch using an adaptive management framework. The first of the measures was enacted in 2006⁶⁴ and the most recent update was in 2018.⁶⁵ These strategies have focused on longline operations, whereby the adoption of mitigation measures, such as the modification of setting practices (i.e. night, deep and side) and gear retrofitting (i.e. tori lines, weighted branch lines, shielded-hooks),⁶⁶ are required for vessels operating north of 23° North and south of 25° South. Conversely, for vessels operating within those two latitudes, which encompasses most of the South Pacific region, these measures are encouraged only but not obligatory. The rationale for such a measure is based on seemingly low by-catch rates recorded within the South Pacific region so far. Almost all countries are parties to this arrangement in the region, which includes international waters as well as exclusive economic zones. The South Pacific Regional Fisheries Management Organisation has also developed mitigation measures to reduce seabird by-catch using an adaptive management framework. The first measures were developed in 2014⁶⁷ and the most recent ones in 2017.⁶⁸ Under this fisheries organisation, the use of mitigation strategies (i.e. modification of

64 Western and Central Pacific Fisheries Commission, 'Conservation and Management Measure to Mitigate the Impact of Fishing for Highly Migratory Fish Stocks on Seabirds' Conservation and Management Measure 2006-02.

65 Western and Central Pacific Fisheries Commission, 'Conservation and Management Measure to Mitigate the Impact of Fishing for Highly Migratory Fish Stocks on Seabirds' Conservation and Management Measure 2018-03.

66 W Papworth, 'Review of Seabird By-Catch Mitigation Measures for Pelagic Longline Fishing Operations' (ACAP, 2010).

67 South Pacific Regional Fisheries Management Organisation 'Conservation and Management Measure for Minimising By-Catch of Seabirds in the SPRFMO Convention Area' CMM 2.04.

68 South Pacific Regional Fisheries Management Organisation, 'Conservation and Management Measure for Minimising By-Catch of Seabirds in the SPRFMO Convention Area' CMM 09-2017.

setting practices and gear retrofitting) is compulsory across its entire area and these modifications are not only compulsory for longlining, but also for trawl operations. This arrangement has two members (i.e. Cook Islands and Vanuatu) in the South Pacific region and only applies to the high seas. In addition to these two regional fisheries management organisations, there are four international institutional arrangements that have provisions for fisheries by-catch, namely the Convention on Migratory Species, the Coral Triangle Initiative, the Pacific Regional Environment Programme, and the Pacific Islands Forum.

Institutional interplay

The biogeography of seabirds occurring in the South Pacific implies that governance for their conservation requires institutional arrangements beyond the region. For instance, the Tahiti Petrel (*Pseudobulweria rostrata*) breeds on islands in Polynesia and Melanesia, but it disperses during the non-breeding season as far east as Peru. Other species visit the South Pacific as non-breeders from far distant areas. For instance, the Black-bellied Storm-petrel (*Fregetta tropica*) breeds in sub-Antarctic islands and the Arctic Skua (*Stercorarius parasiticus*) breeds along the coasts of the north Pacific in Alaska and Russia's Far East, but both species are found within the South Pacific during part of their migratory cycle. Hence, international institutional arrangements from those regions, such as the North Pacific, the Southern Ocean and the Eastern Pacific, that do not overlap jurisdictionally with the South Pacific may be important for conserving seabirds in our region of interest. Institutional interplay between those arrangements and regional international institutional arrangements within the core framework in the South Pacific are a possible approach to scale up governance processes that account for the full life-cycle of some of the seabirds occurring in the region. For the purpose of this analysis, we deliberately focused on political interplay, understood as the formal and explicit linkages between institutional arrangements in the interest of pursuing collective goals.⁶⁹ Hence, other types of institutional interplay, such as cognitive,⁷⁰ could also be relevant for seabird conservation in the South Pacific but are not captured here as they require a different methodological approach.

We found evidence of institutional interplay that complements the spatial scope of the core international institutional framework for seabird conservation in the South Pacific. A total of six memoranda of understanding have been developed between regional fisheries management organisations, that include the South Pacific, and spatially non-overlapping institutional arrangements (Table 6.4). These memoranda are aimed at facilitating coordination and cooperation in areas of mutual concern, including biodiversity conservation. Importantly, these

69 OR Young, *The Institutional Dimensions of Environmental Change: Fit, Interplay, Scale* (The MIT Press, 2002).

70 S Oberthür, 'Interplay Management: Enhancing Environmental Policy Integration Among International Institutions' (2009) 9 *International Environmental Agreements* 371–391.

Table 6.4 Interplay of international institutional arrangements from the core framework and non-spatially overlapping institutional arrangements

<i>Memoranda of Understanding</i>	
Western and Central Pacific FC*	Agreement on the Conservation of Albatrosses and Petrels
Western and Central Pacific FC*	Convention for the Conservation of Antarctic Marine Living Resources
Western and Central Pacific FC*	Inter-American Tropical Tuna Commission
South Pacific RFMO**	Convention for the Conservation of Antarctic Marine Living Resources
South Pacific RFMO**	Permanent Commission for the South Pacific
South Pacific RFMO**	Agreement on the Conservation of Albatrosses and Petrels

Notes

All international institutional arrangements included are part of the framework for conserving seabirds in the South Pacific.

* Western and Central Pacific Fisheries Commission.

** South Pacific Regional Fisheries Management Organisation.

include formal arrangements between Agreement on the Conservation of Albatrosses and Petrels, which is a subsidiary agreement under the Convention on Migratory Species, and both regional fisheries management organisations that overlap with the South Pacific (i.e. the Western and Central Pacific Fisheries Commission and the South Pacific Regional Fisheries Management Organisation). The Agreement on the Conservation of Albatrosses and Petrels includes range states north and south of the South Pacific region, so these specific arrangements are fundamentally important to coordinate and cooperate on addressing fisheries by-catch, in matters such as data collection and exchange, as well as development and implementation of mitigation measures. This specific arrangement only applies to one species occurring within the South Pacific though, the Black Petrel (*Procellaria parkinsoni*), as this is a species-specific arrangement. These two regional fisheries management organisations have also developed memoranda of understanding with institutional arrangements whose jurisdictions are in the Southern Ocean (i.e. the Convention for the Conservation of Antarctic Marine Living Resources) and the Eastern Pacific Ocean (i.e. the Inter-American Tropical Tuna Commission and the Permanent Commission for the South Pacific). Notably, there is no institutional interplay with relevant arrangements in the North Pacific, such as the North Pacific Fisheries Commission and the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea.

Role of non-state actors

The international institutional framework is sourced from national governments; however, civil society also plays a critical role in coordination and

cooperation for conserving seabirds in the South Pacific. In this context, international institutional arrangements become not only a source of normative stances, but also of funding for non-state actors. For instance, the Pacific Regional Environment Programme has a role in sourcing international funding for conservation initiatives, which is often channelled through non-governmental organisations. As the focus of this chapter is on the international institutional framework, only international non-governmental organisations (INGOs) are considered here. In doing so, we only present a few select cases as examples without connoting any relative importance, but rather to showcase their varied roles. Nevertheless, we acknowledge the role in seabird conservation for many other non-governmental organisations, as well as sectors of civil society, such as faith-based organisations and traditional owner groups.

INGOs with a presence in the South Pacific commonly work in partnership with one another, as well as with national and local non-governmental organisations, national government agencies and intergovernmental organisations. Some INGOs have been instrumental in the implementation of international institutional arrangements. For instance, Conservation International, an INGO focused on biodiversity conservation and human well-being, played a pivotal role in the establishment of Kiribati's Phoenix Islands as a World Heritage site under the World Heritage Convention, and now participates actively in its ongoing management. This protected area provides habitat for 19 species of breeding seabirds in addition to habitat for non-breeding seabirds from the Arctic and Antarctic regions. Additionally, Island Conservation, an INGO dedicated primarily to the eradication of invasive species from islands important to seabirds, has a programme in the Pacific that includes a focus on Palau, Palmyra Atoll and French Polynesia, which are important for threatened seabird species (e.g. White-throated Storm-petrel, *Nesofregatta fuliginosa*). This INGO also has an ongoing partnership with the Pacific Regional Environment Programme through the provision of technical capacity. BirdLife International, a bird conservation-oriented global partnership of national non-governmental organisations, has a Pacific Programme that includes five partners operating within the South Pacific. Activities under this programme include: invasive species management, harvest management, active restoration of seabird colonies, identification of key sites for seabird conservation (i.e. Important Bird and Biodiversity Areas and support for nomination of Ramsar sites) and outcome monitoring across the range of activities.

Discussion

Our institutional analysis indicates the existence of international mechanisms of coordination and cooperation for conserving seabirds in the South Pacific. Hence, this is a contribution to the growing literature on the international governance dimensions of bird conservation, which has primarily focused

until now on the Americas, Africa-Eurasia, and the Asia-Pacific.⁷¹ This empirical analysis sheds light on the similarities and differences in relation to other frameworks, however, they need to be considered cautiously as our methods were primarily desktop-based with no validation and refinement through fieldwork. Importantly, our results demonstrate that there are mechanisms available to various degrees for overcoming jurisdictional fragmentation and uneven capacity to address most threats to seabirds in the South Pacific. These arrangements are characterised by the sole participation of the nation-state, as well as a lack of bird conservation-focused regional international arrangements. This research extends our understanding of international bird conservation governance not only to a previously understudied region, but also applied to a group of birds seldom considered scholarly in a conservation governance context.

Despite layering of institutional arrangements with provisions relevant to address some of the threats to seabirds in the South Pacific, a bird conservation regime has seemingly not emerged *per se* in the region. This is evident when considering the total lack of bird conservation-focused regional international institutional arrangements. From a functional and issue-area standpoint, the two arrangements within the core framework more closely aligned with seabird conservation are the Ramsar Convention and the Convention on Migratory Species. However, neither of them is regional nor includes enough provisions for seabird conservation in the South Pacific. On the one hand, the former does not include the seabird family with the most threatened species in the region (i.e. petrels and shearwaters; Procellariidae; Figure 6.2). On the other hand, the latter includes only two species occurring substantially within the South Pacific in its appendices.⁷² Furthermore, the Agreement on the Conservation of Albatrosses and Petrels does not include any of the South Pacific jurisdictions as range states. Similarly, migratory waterbirds in Central Asia⁷³ and migratory songbirds in East Asia⁷⁴ both have an almost non-existent bird conservation-focused regime. This pattern is in

71 R Boardman, *The International Politics of Bird Conservation* (Edward Elgar Publishing, 2006); J Wilson, 'Institutional Interplay and Effectiveness: Assessing Efforts to Conserve Western Hemisphere Shorebirds' (2008) 8 *International Environmental Agreements* 207–226; E Gallo-Cajiao, TH Morrison, P Fidelman, S Kark, and RA Fuller, 'Global Environmental Governance for Conserving Migratory Shorebirds in the Asia-Pacific' (2019) 19 *Regional Environmental Change* 1113–1129; M Lewis, 'AEWA at Twenty: An Appraisal of the African-Eurasian Waterbird Agreement and Its Unique Place in International Environmental Law' (2016) 19 *Journal of International Wildlife Law & Policy* 22–61.

72 Henderson Petrel (*Pterodroma atrata*; Appendix I); Black [Parkinson's] Petrel (*Procellaria parkinsoni*; Appendix II).

73 Galbraith et al. (n 11).

74 DL Yong, Y Liu, BW Low, CP Española, CY Choi, and K Kawakami, 'Migratory Songbirds in the East Asian-Australasian Flyway: A Review from a Conservation Perspective' (2015) 25 *Bird Conservation International* 1–37.

contrast with migratory birds in North America, as well as migratory waterbirds in the Asia-Pacific and Africa-Eurasia. These regions have frameworks of international institutional arrangements that include bird conservation-focused arrangements, such as the US-Canada Migratory Bird Treaty, the East Asian-Australasian Flyway Partnership and the African-Eurasian Migratory Waterbird Agreement, respectively. Our results are consistent with previous institutional analyses of the Central Pacific, where a regime has not emerged despite having been identified as an important migratory bird flyway, not only for seabirds but also for shorebirds.⁷⁵ Potential explanations for this gap could include the lack of hegemonic countries with enough interest in leading the development of regional bird conservation-focused arrangements, as well as a relatively low participation of epistemic communities and advocacy organisations.⁷⁶ Despite the lack of specific bird conservation-focused international arrangements, a plethora of instruments with relevance to seabird conservation has emerged in the South Pacific.

The international institutional framework for seabird conservation in the South Pacific presents similarities and differences with other issue areas. The emergent framework is characterised by institutional complexity, given by the layering of arrangements that have different spatial scopes, political jurisdictions and provisions. Hence, this framework could be conceptualised as a regime complex, which is defined as an array of partially overlapping and non-hierarchical institutions governing a particular issue area.⁷⁷ Regime complexes have also been identified in other issue areas, such as climate change,⁷⁸ forests⁷⁹ and genetic plant resources.⁸⁰ In the case of climate change, even though the regime complex includes a range of institutional arrangements, the United Nations Framework Convention on Climate Change plays a pivotal role as the main issue-focused international institutional arrangement. By contrast, the forest regime complex does not have a main overarching issue-focused institutional arrangement, similar to what could be dubbed the South Pacific seabird conservation regime complex. Furthermore, regime complex has primarily attempted to conceptualise state-centric international institutional frameworks, which is the case of seabird conservation in the South Pacific. Notably, the institutional arrangements identified in our analysis include only nation-state

75 Galbraith et al. (n 11).

76 OR Young, *Creating Regimes: Arctic Accords and International Governance* (Cornell University Press, 1998); Boardman (n 74).

77 RO Keohane and DG Victor, 'The Regime Complex for Climate Change' (2011) 9 *Perspectives on Politics* 7–23.

78 Ibid.

79 L Giessen, 'Reviewing the Main Characteristics of the International Forest Regime Complex and Partial Explanations for Its Fragmentation' (2013) 15 *The International Forestry Review* 60–70.

80 K Raustiala and DG Victor, 'The Regime Complex for Plant Genetic Resources' (2004) 58 *International Organization* 277–309.

participation, with no role in rule-making for the civil society, the private sector or subnational state actors (i.e. local government areas). This pattern is in contrast with the framework for migratory shorebird conservation in the Asia-Pacific, where the agency of actors for rule-making has extended beyond the nation-state.⁸¹

The temporal emergence of international institutional arrangements likely signals some global and regional trends. For instance, treaty-making within the region and accession to global arrangements could be somewhat reflective of major governance milestones at a global scale, such as the 1972 United Nations Conference on the Human Environment, the 1992 Rio Summit, and the 2002 World Summit on Sustainable Development. A similar pattern of emergence has also been observed in the international institutional framework for migratory shorebird conservation in the Asia-Pacific.⁸² However, the temporal patterns in relation to the initial rise of the corresponding frameworks have been different in North America and Europe. In both cases, the international institutional frameworks started to emerge in the early 1900s.⁸³ Potential explanations for such a difference could be the longer historical trajectory of the modern states in those latter regions, as well as earlier interest and development of bird research and conservation.⁸⁴ Additionally, accessions to existing arrangements, as well as development of new arrangements, have generally stalled since 2014 in the South Pacific, though an exception is the recent accession of Vanuatu to the Ramsar Convention. This trend is in contrast to the case of migratory shorebird conservation in the Asia-Pacific, where rates of joining agreements have not slowed down in recent years.⁸⁵ This difference may signal potential differences in perceived conservation needs, the role of civil society, as well as financial and technical capacity.

The South Pacific should be considered a nested social-ecological system because conserving seabird species requires a full life-cycle approach. While some seabird species are entirely confined to the South Pacific region, such as the Fiji Petrel (*Pseudobulweria macgillivrayi*),⁸⁶ others only occur temporarily during their trans-equatorial migrations, such as the Short-tailed Shearwater (*Ardenna tenuirostris*), spanning high latitudes in the northern and southern hemispheres.⁸⁷ Hence, gaps in the international institutional framework need to be considered at two spatial scales, namely the South Pacific region and the

81 Gallo-Cajiao et al. (n 71).

82 Ibid.

83 Boardman (n 71).

84 Ibid.

85 Gallo-Cajiao et al. (n 71).

86 D Priddel, N Carlile, K Moce, and D Watling, 'A Review of Records and Recovery Actions for the "Critically Endangered" Fiji Petrel *Pseudobulweria macgillivrayi*' (2008) 18 *Bird Conservation International* 381–393.

87 MJ Carey, RA Phillips, JRD Silk, and SA Shaffer, 'Trans-Equatorial Migration of Short-Tailed Shearwaters Revealed by Geolocators' (2014) 114 *Emu: Australian Ornithology* 352–359.

entire latitudinal range of some migratory species, which can include the entire Pacific Ocean, as well as parts of the Southern and Arctic Oceans. At the scale of the South Pacific, we discovered the existence of institutional arrangements that enable coordination and cooperation to potentially address most threats, though with variation. Among them, the Pacific Regional Environment Programme plays an important role as the institutional arrangement with the highest coverage both spatially and prescriptively. This pattern reflects the importance of this international institutional arrangement as pivotal within the South Pacific environmental conservation framework more generally.⁸⁸ When considering the core international institutional framework as a whole, habitat loss and invasive species are the threats most comprehensively covered, while hunting and fisheries by-catch have the least coverage. However, as there is not a single region-wide bird conservation-focused international institutional arrangement, overarching coordination accounting specifically for the ecology of seabirds is likely largely lacking. This shortcoming is very salient in the case of invasive species management and protected areas, both of which play a vital role in seabird conservation. In this case, perhaps soft instruments developed by non-governmental organisations, such as BirdLife International's Important Bird and Biodiversity Areas programme, can provide the blueprint to be implemented through the actual international institutional arrangements, such as the Ramsar Convention and the World Heritage Convention. At the scale of the entire Pacific Ocean, while most of the global international institutional arrangements present a wide coverage (i.e. the Convention on Biological Diversity, the Ramsar Convention or the World Heritage Convention), there are perhaps more gaps, as we found evidence of institutional interplay only for seabird by-catch. Furthermore, outside the South Pacific, which is dominated by exclusive economic zones, there are vast areas beyond national jurisdictions. These expanses have major environmental governance gaps, including the lack of a robust institutional framework for establishing protected areas. Those shortcomings are, however, the current subject of international negotiations for a new institutional arrangement under the United Nations.⁸⁹ In all, a bird conservation-focused international institutional arrangement for the Central Pacific Flyway is perhaps a major element missing from the South Pacific seabird conservation regime complex, even if such an arrangement only plays a coordinating role among the already existing institutional arrangements.

88 R Herr, 'Environmental Protection in the South Pacific: The Effectiveness of SPREP and Its Conventions' in OS Stokke and ØB Thommessen (eds) *Yearbook of International Cooperation on Environment and Development 2002/03* (Earthscan, 2002), 41–50.

89 E Mendenhall, E De Santo, E Nyman, and R Tiller, 'A Soft Treaty, Hard to Reach: The Second Inter-Governmental Conference for Biodiversity Beyond National Jurisdiction' (2019) 108 *Marine Policy* 103664; KM Gjerde, LLN Reeve et al., 'Protecting Earth's Last Conservation Frontier: Scientific, Management and Legal Priorities for MPAS Beyond National Boundaries' (2016) 26 (Suppl. 2) *Aquatic Conservation* 45–60.

Further directions

Based on our institutional analysis, we have identified key areas for further research that would help better guide seabird conservation in the South Pacific, while contributing to the environmental governance literature. One of the most prominent follow-up empirical questions is perhaps why a bird conservation-focused regime has not emerged in the region. This is not only a perennial question of institutional theory deserving attention in its own right,⁹⁰ but also has the potential to provide key insights into overcoming barriers for further institution building. Our study focused exclusively on institutional arrangements, however, those are only one component of the governance system for conserving seabirds in the South Pacific. Hence, researching other aspects of governance, such as financial mechanisms and the role of science, should be a priority as those are pillars to advance conservation goals. Here we have laid some foundations on our understanding of international institutional arrangements for conserving seabirds, especially regarding gaps and strengths. Accordingly, follow-up research should focus on the domestic implementation of, and alignment with, such institutional arrangements, as international rules must be ultimately translated into on-ground actions if they are to be effective. Finally, empirical research on the role of civil society and market-based mechanisms in marine governance could also help advance seabird conservation, such as the case of the Marine Stewardship Council, which has eight certified fisheries in the South Pacific region.

Conclusions

Seabirds are an important component of biodiversity in the South Pacific and their conservation requires overcoming jurisdictional fragmentation. Despite the fact that not all seabirds occurring in the region are migratory, they still require international institutional arrangements due to the transboundary nature of some of their threats. Our analysis indicates that there is a set of international institutional arrangements that generally address, at least prescriptively, most threats to seabirds in the South Pacific. However, the provisions of these arrangements present nuances in coverage, with protected areas and invasive species being more comprehensively considered than hunting and fisheries by-catch. Moreover, despite the existence of multiple relevant international institutional arrangements, the general lack of bird conservation-focused instruments likely limits their potential to achieve seabird conservation goals. Hence, orchestration between those arrangements by policy and regime entrepreneurs,⁹¹ even if using

90 BG Peters, *Institutional Theory in Political Science: The New Institutionalism* (Edward Elgar Publishing, 2019).

91 KW Abbott, 'Strengthening the Transnational Regime Complex for Climate Change' (2013) 3 *Transnational Environmental Law* 57–88; J Kingdon, *Agendas, Alternatives, and Public Policies* (2nd ed.) (Pearson, 2014).

available soft instruments as blueprints, could foster current conservation efforts. Noteworthy, seabirds pose a unique challenge to effective conservation governance when compared to other birds because: (1) they often use international waters beyond national jurisdictions; (2) their movements are difficult to study; and (3) they rely on areas at sea that can be quite discrete at larger scales, but quite mobile at smaller scales. Consequently, as our knowledge of seabird movements improves through advances in technology, it will be critically important to ensure it is actively incorporated throughout the policy cycle and institution-building processes.⁹² Our findings confirm that international governance that includes migratory birds warrants attention not only in its own right as an approach to provide advice for advancing conservation, but also as a fertile ground to contribute to the environmental governance literature.

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92 Dunn et al. (n 52).