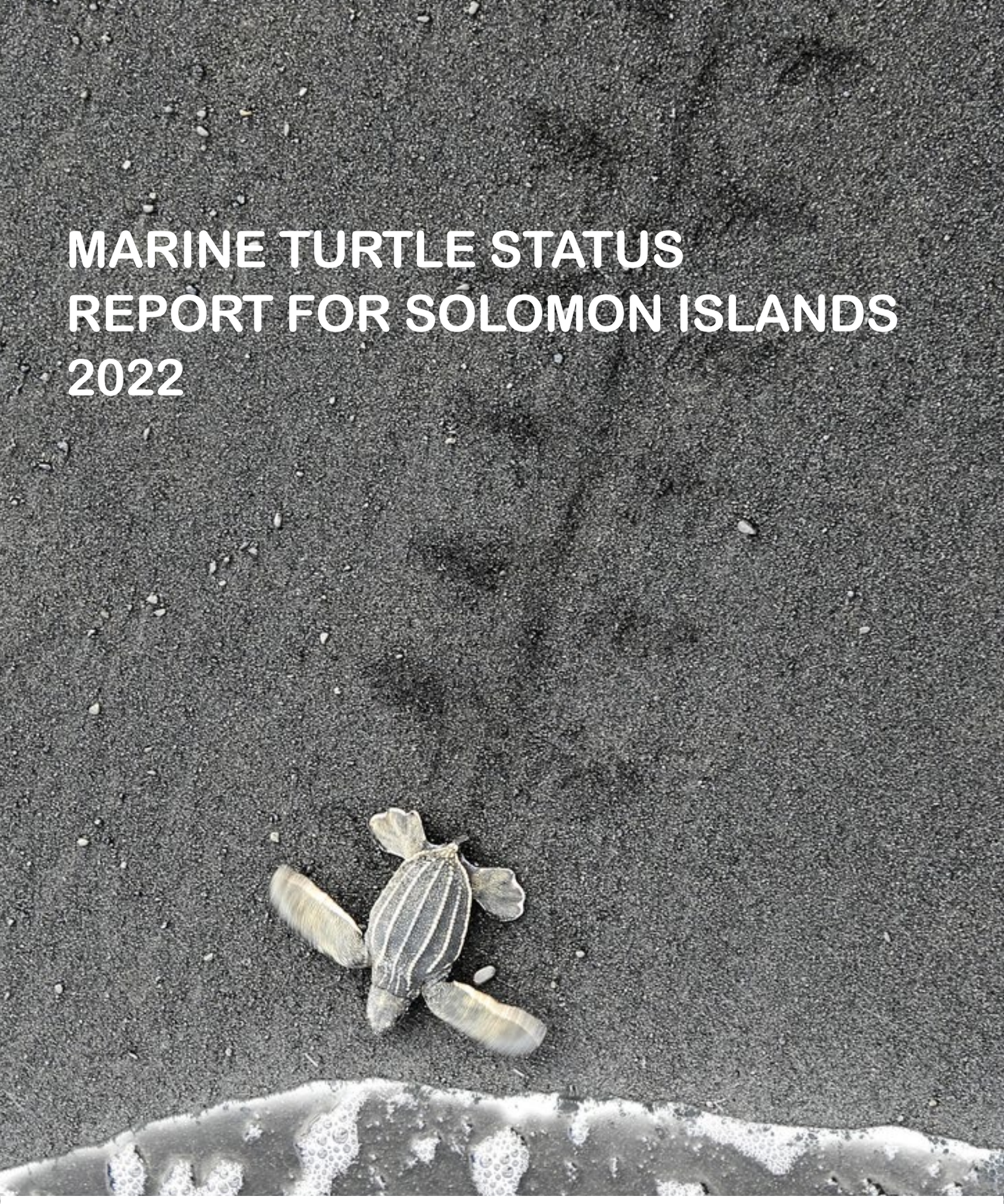
MARINE TURTLE STATUS REPORT FOR SOLOMON ISLANDS 2022



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PO Box 240, Apia, Samoa
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Our vision: The Pacific environment, sustaining our livelihoods and natural heritage in harmony with our cultures.

Marine Turtle Status Report for Solomon Islands 2022

by: Robert Howard

Contents

Acronyms

ACMCA	Arnavon Community Marine Conservation Area
ACMP	Arnavon Community Marine Park
AMCA	Arnavon Marine Conservation Area
BIEM	By-catch and Integrated Ecosystem Management
CBD	Convention on Biological Diversity
CCL	Curved Carapace Length
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EEZ	Exclusive Economic Zone
FAD	Fish Aggregating Device
GBR	Great Barrier Reef
GEF	Global Environment Facility
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unregulated and Unreported
LMMA	Locally Managed Marine Area
MFMR	Ministry of Fisheries and Marine Resources
MRF	Marine Research Foundation
MSC	Marine Stewardship Council
NBSAP	National Biodiversity Strategy and Action Plan
NOAA	National Oceanic and Atmospheric Administration
NPOA	National Plan of Action
PIT	Passive Integrated Transponder
PNG	Papua New Guinea
RMU	Regional Management Units
SICCP	Solomon Islands Community Conservation Partnership
SPREP	Secretariat of the Pacific Regional Environment Programme
SSF	Small Scale Fisheries
TNC	The Nature Conservancy
TDA	Tetepare Descendants Association
TREDS	Turtle Research and Monitoring Database System
UNCLOS	United Nations Convention on the Law of the Sea
WCPFC	Western and Central Pacific Fisheries Commission
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature

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Executive summary

Solomon Islands is a key foraging and nesting site for the critically endangered hawksbill turtle (*Eretmochelys imbricata*), endangered green turtle (*Chelonia mydas*), the critically endangered population of Pacific leatherback turtles (*Dermochelys coriacea*), the endangered South Pacific subpopulation of loggerhead turtle (*Caretta caretta*), and the vulnerable olive ridley turtle (*Lepidochelys olivacea*). These species of turtle are important culturally, economically and nutritionally in Melanesia. In Solomon Islands, conservation and protection of all five species has been ongoing since the 1970s. However, like marine turtles globally, their numbers in Solomon Islands have suffered steep declines because of unintentional by-catch, hunting for meat or the curio trade, harvesting of eggs, and climate change.

To partially address this issue, in 2019 the Secretariat of the Pacific Regional Environment Programme (SPREP) commenced the Pacific-European Union Marine Partnership Programme By-catch and Integrated Ecosystem Management (BIEM) Initiative for Solomon Islands, which includes the development of the 5-year National Plan of Action (NPOA) – Marine Turtles, 2022–2026. To guide the NPOA, this literature review was undertaken to assess the former and current literature on marine turtle conservation in Solomon Islands, collate quantitative knowledge/data on nesting beaches and foraging grounds, review current and future threats, and review current legislation on turtles and enforcement of these legal instruments.

Key findings from the review include:

■ Marine turtles in Solomon Islands are protected under the Fisheries Act (2015), stating that people cannot fish for and retain or be in the possession of, sell, buy or export nesting marine turtle or any leatherback turtle. Subsistence fishing, aside from leatherbacks is however, allowed.

■ Species review

Hawksbill turtles:

- Arnavon Islands is the most important site for hawksbills in Solomon Islands, being the largest rookery in the South Pacific.

- Surveys from the Arnavons from the early 1990s to 2012 show a doubling of nests laid since the establishment of the Arnavon Community Marine Conservation Area (ACMCA).

Leatherback turtles:

- Isabel and Western Provinces are the key nesting sites for this species, namely on Isabel Island in the former, and Rendova and Tetepare Islands in the latter.

- On Isabel, at Haveo and Sasakolo beaches, over 80 nests (on each beach) were recorded in the 2021/22 nesting season. On Tetepare and Rendova combined, an average of 166 nests per year were recorded between 2018 and 2021.

Green turtles:

- Key nesting sites for this species have been in Isabel Province, and Solomon Islands has been noted as important for juvenile green turtles as developmental habitat.

- Data for this species is quite old, with the highest figures recorded for Isabel Province in 1989, with an estimated 259−438 nests.

Loggerhead turtles:

- Nesting or foraging sites for loggerheads appear to be limited in Solomon Islands and also for the South Pacific subpopulation more broadly. Loggerheads have been reported on Ontong Java, but it is unknown if this was foraging or nesting, and on Wagina Island.

Olive ridley turtles:

- Hatchlings of this species have been recorded on Guadalcanal, Wagina, Makira and Malaita islands. Given the paucity of observations of this species in Solomon Islands, their status or estimated number remains unknown.

■ Threats

- By-catch: available data report very low catch rates of marine turtles. Absent from the literature is information on by-catch from small scale fisheries, in addition to non-certified commercial fisheries. Given the impact these fisheries have caused on marine turtles worldwide, the impact of by-catch in Solomon Islands is potentially very high.

- Community Consumption: Vuto et al. (2019) undertook a comprehensive assessment of marine turtle harvest in Solomon Islands and found that approximately 9,473 turtles are harvested annually.

- Wildlife trade: while not at historical levels (e.g. over 4,000 hawksbills traded in the 1980s to Japan), trade in marine turtles is still a concern given their low population numbers. Hawksbill products originating from Solomon Islands stock have been identified in markets in Papua New Guinea. Jewellery made from hawksbill shell was also found for sale in Honiara markets (LaCasella 2021).

- Climate Change: increased frequency and intensity of storms has caused flooding of nests and beach erosion. There is also concern that natural sand temperatures could increase because of climate change and impact embryo survival and marine turtle sex-ratios.

- Predation: while quantifiable data is limited, marine turtles, and their nests have been observed preyed upon by a range of species. In the nests and on the beach, this includes: monitor lizards, ghost crabs, rats, birds, dogs, pigs; and in the water: sharks, snapper and crocodiles.

- Other: while not listed in the literature for Solomon Islands, a number of other threats are known to negatively impact marine turtles in the Pacific, including light pollution, plastic pollution, ghost gear, unsustainable coastal development, Fish Aggregating Devices (FADs), boat strikes and fibropapilloma disease.

■ Examples of current research and management initiatives:

- Arnavon Community Marine Park: hawksbill nest protection and monitoring by the Park Rangers, along with more in-depth research including satellite tagging.

- Isabel Island: leatherbacks at four sites are currently being monitored, including Sasakolo, Litoghahira, Haevo and Sosoilo. Work includes tagging, nest monitoring and Passive Integrated Transponder (PIT) tagging.

- Tetepare/Rendova: nest protection and monitoring of leatherbacks and occasional greens by the Community Rangers, including hatchery management for threatened nests.

■ The following recommendations are made:

(i) Improve knowledge on population trends based on both nesting and in-water monitoring through:
- Identification of the most productive nesting beaches and work towards long-term monitoring and nest protection at these sites (ideally through community led monitoring programmes).
- Identification of key foraging sites and undertake annual in-water surveys.

(ii) Strengthen understanding of post nesting migration routes and foraging grounds:
- Undertake satellite tagging of leatherbacks and greens (as data is limited for these species) to identify their migration routes and foraging grounds.

(iii) In relation to improving understanding of the level of by-catch, undertake initial surveys through questionnaires in communities to gauge number of boats, gear types and level of interaction with marine turtles.

(iv) Strengthen understanding of the impacts of climate change on nesting beaches and hatchlings by recording sand temperature readings of natural sand, in situ nest and hatchery nest chambers. Undertake monitoring of beach erosion and tidal incursion at key nesting beaches.

(v) Strengthen understanding in relation to predation on hatchlings, undertake surveys of predation levels, and species on key nesting beaches, tied with hatching success records.

(vi) To understand the legislative impact on subsistence or culture of local communities, undertake surveys through questionnaires in communities to gauge economic and cultural impact bans on subsistence harvest may cause.

(vii) Develop a central database to improve coordination/ centralisation of data through the Solomon Islands turtle working committee.

Solomon Islands is a key foraging and nesting site for the critically endangered population of Pacific leatherback turtles. Photo: Björn Svensson © WCS

Background

Marine turtles play a vital role in keeping ocean ecosystems healthy and functioning, including maintaining coral reefs and seagrass beds, transporting and cycling nutrients from the water to the beaches, balancing food webs and providing habitat and food for other marine species (Bjorndal 1980; Meylan 1988; Gyuris 1994; Bouchard and Bjorndal 2000; Wilson et al. 2010). Like many other species however, their populations have historically suffered steep declines because of unintentional by-catch, hunting for meat or the curio trade, harvesting of eggs and climate change (Wallace et al. 2011; Mazaris et al. 2017; Vuto et al. 2019; Jino et al. 2018; Pilcher 2021). Globally, conservation efforts have been ongoing since the 1950's, with a number of regional management units (RMUs) showing positive trends in abundance following protection of eggs and nesting females (Mazaris et al. 2017). This includes in Solomon Islands, where critically endangered[1] hawksbill turtles (*Eretmochelys imbricata*) have shown signs of recovery as a result of routine beach monitoring and the establishment of a community led Marine Protected Area in the Arnavon islands (Hamilton et al. 2015), in addition to protection of their foraging grounds in Australia (Bell and Jensen 2018). However, Hamilton et al. (2015) note, while the hawksbill numbers have increased, they are still under threat from rising levels of harvesting in their nesting habitat, as well as poaching within the Marine Park.

In addition to hawksbill turtles, Solomon Islands is also a key foraging and nesting site for the endangered green turtle (*Chelonia mydas*), the critically endangered population of Pacific leatherback turtles (*Dermochelys coriacea*), the endangered South Pacific subpopulation of loggerhead turtles (*Caretta caretta*), and vulnerable olive ridley turtles (*Lepidochelys olivacea*)[2]. These species of marine turtles are important culturally, economically and nutritionally in Melanesia. In Solomon Islands, conservation and protection of all five species has been ongoing since the 1970's (McKeown 1977; Wilson et al. 2004). While there have been some positive results, notably for hawksbills, this is not the same for all species. Leatherback populations for example, have declined by 80 per cent since the 1980's in the Pacific Ocean (NOAA 2021) and in Solomon Islands, the inundation of nests from storm events is having devastating impact on the species' chance of recovery. In addition, despite a ban on trade in marine turtles in 1992, turtle products are still being sold, with an estimated 9,473 turtles harvested each year in Solomon Islands, mainly by spearfishers (Vuto 2019).

In 2009, to better coordinate conservation efforts, a marine turtle working committee was formed and they developed the *Solomon Islands Turtle Strategic Action Plan 2008−2012*. It has been almost 10 years since the action plan's term has ended and there is limited information on what actions were achieved or even started, or if these were successful. One of the Solomon Islands *National Biodiversity Strategy and Action Plan (NBSAP) 2016−2020* targets was to develop a National Plan of Action (NPOA) − Marine Turtles, yet by 2019 little movement had been made on the NPOA or understanding performance against the Strategic Action Plan.

To partially address this issue, the Secretariat of the Pacific Regional Environment Programme (SPREP) recently developed a new Pacific Islands Regional Marine Species Programme 2022–2026, which includes marine turtles. In 2019, SPREP commenced implementation of the By-catch and Integrated Ecosystem Management (BIEM) Initiative of the Pacific-European Union Marine Partnership (PEUMP) Programme funded by the European Union and the Government of Sweden. Activity 5.5 of the BIEM Initiative includes development of the Solomon Islands *5-year National Plan of Action – Marine Turtles, 2022–2026*. This will include reformation of the turtle working committee to review the 2008–2012 plan and assess those actions which were completed, underway, not-

[1] As per the IUCN Red list for threatened www.iucnredlist.org

[2] Only one record of flatback turtle (*Natator depressus)* exists for Solomon Islands, caught on a longline vessel (location unknown) (Morison et al. 2016). As such a review of the species is not given here. For more on the species in the region see Pilcher (2021).

completed, not-started, useful, or no longer relevant. This report aims to support this process through reviewing the former and current literature on marine turtle conservation in Solomon Islands; collating quantitative knowledge/data on nesting beaches and foraging grounds; reviewing current and future threats; and reviewing current legislation on turtles and enforcement of these legal instruments.

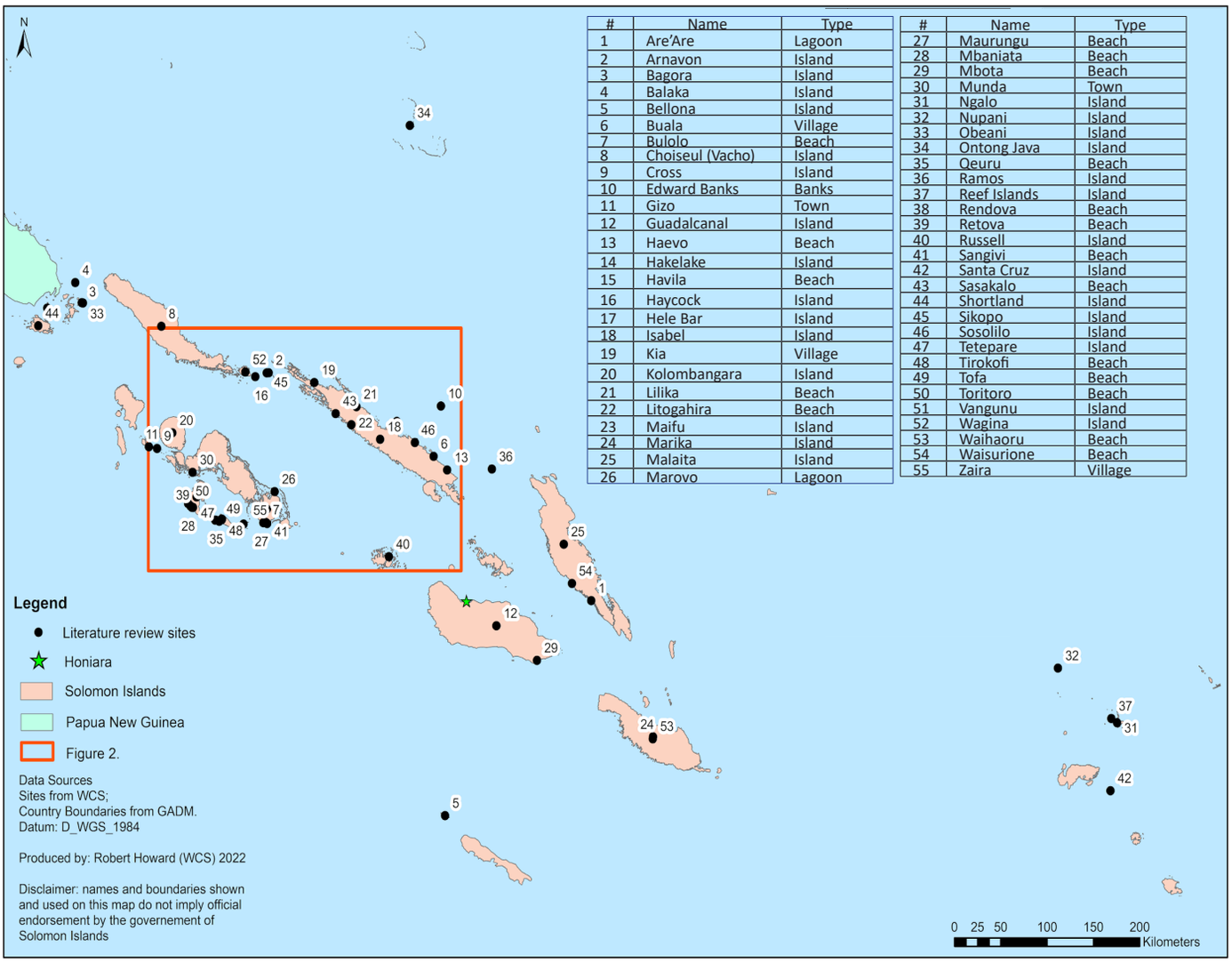
Geographical context

While this review is centred on Solomon Islands, it must be noted that the conservation of marine turtles focuses on regional management units (RMUs), rather than country boundaries, and organises "*marine turtles into units of protection above the level of nesting populations, but below the level of species*" (Wallace et al. 2010a). RMUs are separated from each other based on genetics, movement, demography and distribution. For Solomon Islands, the five marine turtles are included in the following RMUs: green – southwest Pacific; hawksbill – southwest Pacific; leatherback – west Pacific; olive ridley – west Pacific; and loggerhead – South Pacific (see maps in Wallace et al. [2010a] which show these RMUs in the context of Solomon Islands).

As outlined below in the section on *Species – Biology, Ecology and Status*, marine turtles can migrate thousands of kilometres each year and their life histories may overlap with several countries e.g. hawksbill nest in Solomon Islands while foraging on Australia's Great Barrier Reef (Hamilton et al. 2021). While the 5-year National Plan of Action – Marine Turtles, 2022–2026 will need to take this into consideration, and form partnerships and collaborate internationally, it is expected that the Pacific Islands Regional Marine Species Plan for marine turtles for 2022–2026 will help address the more regional work.

Solomon Islands is situated northwest of Vanuatu and to the east of Papua New Guinea within the eastern edge of the Coral Triangle, and is made up of nearly 1,000 islands and cays spread across approximately 1,700 km (Carlton et al. 2020, Jupiter et al. 2019) (Figure 1 and Figure 2). The exclusive economic zone (EEZ) covers 1,589,477 km^2, 98 per cent of which is ocean (Jupiter et al. 2019). The inshore areas possess a rich diversity of habitats, including coral reefs, seagrass beds, long black and white sandy beaches, mangrove forests and mudflats. Its offshore marine areas are likewise very diverse, including deep sea trenches, hydrothermal vents, seamounts and canyons (Ceccarelli et al. 2018). This variety and Solomon Islands' tropical location makes it an ideal area for marine turtles, with suitable nesting beaches and foraging habitat for all species, including the leatherbacks that are known to dive well below 1,000 m to feed (Hays et al. 2004).

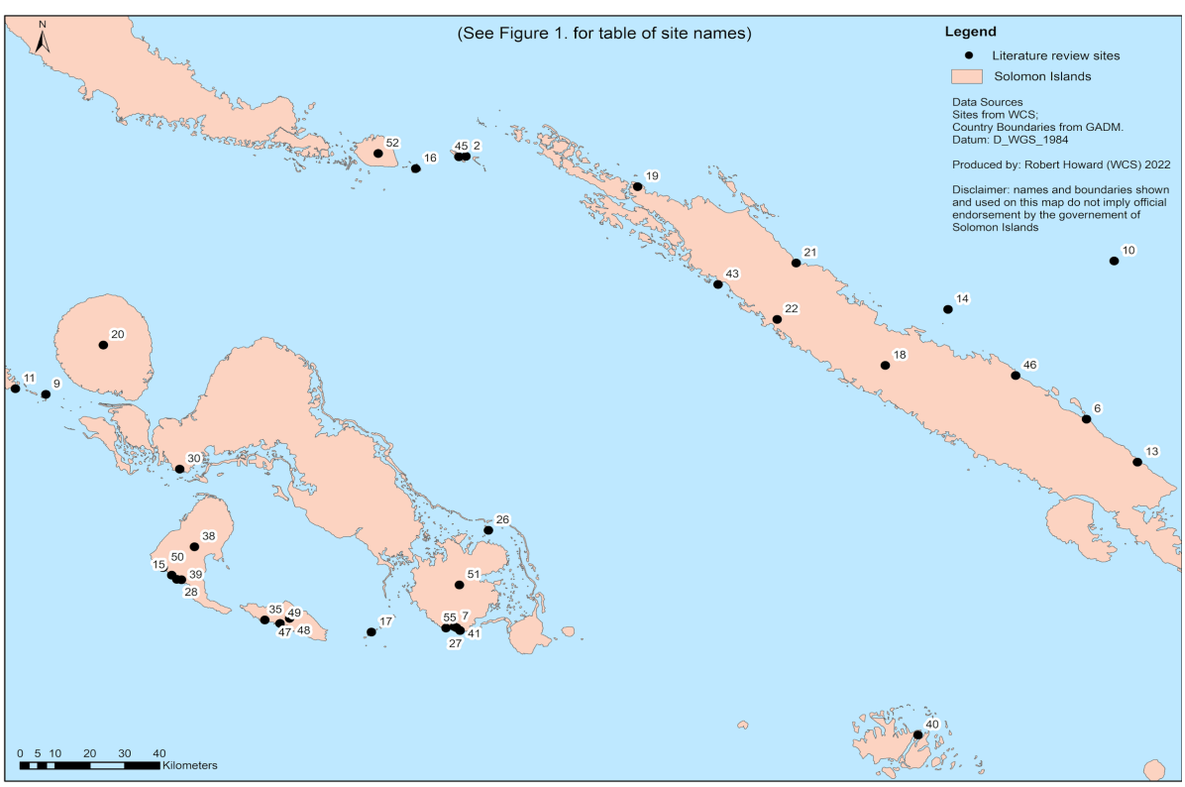
Figure 1. Map of sites listed throughout the document.



#	Name	Type
1	Are'Are	Lagoon
2	Arnavon	Island
3	Bagora	Island
4	Balaka	Island
5	Bellona	Island
6	Buala	Village
7	Bulolo	Beach
8	Choiseul (Vacho)	Island
9	Cross	Island
10	Edward Banks	Banks
11	Gizo	Town
12	Guadalcanal	Island
13	Haevo	Beach
14	Hakelake	Island
15	Havila	Beach
16	Haycock	Island
17	Hele Bar	Island
18	Isabel	Island
19	Kia	Village
20	Kolombangara	Island
21	Lilika	Beach
22	Litogahira	Beach
23	Maifu	Island
24	Marika	Island
25	Malaita	Island
26	Marovo	Lagoon

#	Name	Type
27	Maurungu	Beach
28	Mbaniata	Beach
29	Mbota	Beach
30	Munda	Town
31	Ngalo	Island
32	Nupani	Island
33	Obeani	Island
34	Ontong Java	Island
35	Qeuru	Beach
36	Ramos	Island
37	Reef Islands	Island
38	Rendova	Beach
39	Retova	Beach
40	Russell	Island
41	Sangivi	Beach
42	Santa Cruz	Island
43	Sasakalo	Beach
44	Shortland	Island
45	Sikopo	Island
46	Sosolilo	Island
47	Tetepare	Island
48	Tirokofi	Beach
49	Tofa	Beach
50	Toritoro	Beach
51	Vangunu	Island
52	Wagina	Island
53	Waihaoru	Beach
54	Waisurione	Beach
55	Zaira	Village

Figure 2. Map inset from Figure 1, sites listed throughout the document.



Legislative framework

International conventions and agreements

Solomon Islands is party to several international conventions and agreements, which address marine turtles, along with their key habitats for nesting, foraging and migration. These include:

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
Solomon Islands became a party to CITES on 26 March 2007. This convention lists species covered under three appendices according to their conservation status. All marine turtles are listed under Appendix I, which is the highest level of protection under this convention. Appendix I species are those threatened with extinction, and trade of these species or their parts is only permitted under exceptional circumstances.

United Nations Convention on the Law of the Sea (UNCLOS)
UNCLOS came into force in 1994 and is an international legal framework for all maritime and marine activities, of which Solomon Islands is a party. While not specifically mentioning marine turtles, it does advise that when stocks overlap with two or more EEZs, the States should seek agreement on their conservation.

Convention on Biological Diversity (CBD)
Solomon Islands became a party to the CBD in 1996. The convention seeks to ensure the conservation and sustainable use of biodiversity. Solomon Islands is working to meet this goal through the development and implementation of its National Biodiversity Strategic Action Plan (NBSAP), which addresses marine turtle conservation (see NBSAP below).

Pacific Islands Regional Marine Species Programme 2022–2026
This SPREP programme includes a Turtle Action Plan for marine turtles, which aims to conserve marine turtles and their habitats, in keeping with the traditions of the people of the Pacific Islands region. The plan is centred on nine key themes including: research and monitoring; climate change; ecosystem and habitat protection; threat reduction; cultural significance and value; legislation, policy and management; ecotourism and livelihoods; capacity building and collaboration; and education, awareness and communication.

Western and Central Pacific Fisheries Commission (WCPFC)
Solomon Islands is a member state of the WCPFC, which seeks to address improvements in the management of high seas fisheries. This includes the management of by-catch and stipulates the safe handling and release of marine turtles.

National legislation and management plans

Solomon Islands has several laws that address the protection of marine turtles, along with plans and strategies detailing conservation measures for the species. These include:

Fisheries Act (2015)
The purpose of this Act is to ensure the long-term conservation and sustainable use of Solomon Islands' fisheries resources. While the Act does not specifically address marine turtles (this is in the regulations, below) it does stipulate that "*biodiversity in the fisheries waters shall be protected*".

Fisheries Management (Prohibited Activities) Regulations 2018
Through the Fisheries Act (2015) these regulations stipulate those fisheries activities that are prohibited. This includes a specific reference to marine turtles in which people cannot fish for and retain, or be in the possession of, sell, buy or export nesting marine turtle or any leatherback turtle (which was initiated in 1993 with the Fisheries Regulation LN43/1993). It is also prohibited to destroy marine turtle nests or eggs,

[3] Note, there is also the Convention on the Conservation of Migratory Species of Wild Animals, however Solomon Islands is listed as a non-member and national reports only relate to dugongs (https://www.cms.int/en/country/solomon-islands).

a turtle with a tag attached or the tag attached to the turtle. This does mean that hunting turtles for subsistence purposes is allowed, except for leatherbacks.

Fisheries Management Regulations 2017
Through the Fisheries Act (2015), these regulations stipulate the obligations of certain fishing vessels in minimising by-catch of marine turtles. Section 8 instructs that, where practicable, vessels must "*avoid encirclement of marine turtles*", safely release a turtle if entangled and carry dip nets and line cutters on board to rescue caught turtles.

Wildlife Protection and Management Act (1998)
The objectives of this Act are to ensure the protection, conservation and management of wildlife through regulating their export and import. The Act prohibits the export of all five species of turtles found in Solomon Islands, except for scientific purposes (Section 11 [1] of the Act).

National Biodiversity Strategy and Action Plan (NBSAP) 2016 to 2020
Adhering to its CBD commitments, Solomon Islands developed its second NBSAP in 2015. The vision of the current plan is to safeguard Solomon Islands' biodiversity and ensure ecosystem services continue to prevail for the people. The plan includes a specific target for turtles: "*By 2018, a national policy or management plan is developed and adopted for protecting of turtles and turtle nesting sites, and if necessary, develop local actions plans for their recovery to complement regional and international turtle programme initiatives"*. While it is clear this target has not been achieved, the section below, on research and management, details what activities have been implemented by government agencies, Community Based Organisations, NGOs and local communities. The development of the Solomon Islands NPOA for marine turtles through the BIEM Initiative will, however, look to achieve this target and will link with another of the NBSAP targets to integrate the NPOA into the Pacific Islands Regional Marine Species Programme.

Solomon Islands Tuna Management and Development Plan
This plan is to guide future management and development of tuna fisheries within Solomon Islands. This includes assessing the ecosystem impacts caused by tuna fisheries, with a special reference to marine turtles. The plan indicates they must have implemented Conservation and Management Measures for marine turtles by July 2014 and that there must have been awareness training in turtle mitigation. It is unknown at this stage if these have been achieved.

Community led protection mechanisms

Local communities also have the right to protect marine turtles, providing legal recognition of some tribes' traditions, which ban hunting and eating of the species, such as in the Are' Are lagoon (Masolo and Ramohia 2016), or for any community wishing to conserve marine turtles. This is done through customary marine tenure systems in which the community declares part of their traditional fishing grounds as protected and the harvesting of certain species within, banned or managed.

In Western Province, the Wildlife Conservation Society (WCS) is currently working with four communities to sustainably manage their fishery while also protecting rare and threatened species (Dr Alec Hughes, pers comm.). This is being achieved through the establishment of Locally Managed Marine Areas (LMMAs) within their traditional fishing grounds. In these LMMAs, communities have created a set of rules about areas that can be fished, allowable gear types and banning the harvest of marine turtles and their eggs within the area. The banning of marine turtle harvest includes foraging turtles as opposed to just nesting turtles, which the above fisheries regulation addresses.

The Arnavon Community Marine Park (ACMP) was designated in 1995 and gained national park status in 2017, covering 152 km^2 of land and sea (Hamilton et al. 2021). While the Park hosts an array of wildlife, one of its main objectives is to "protect the nesting ground and rookery of the hawksbill and other marine turtles in the area", being the most important nesting site for hawksbills in the Western Pacific (The Arnavon Marine Park, 2015).

Species – Biology, Ecology and Status

Hawksbill turtle (*Eretmochelys imbricata*)

General

The hawksbill is identified by its pointed face and distinct overbite, with a shell of overlapping scutes (hence the name imbricata, which in Latin means overlapping like shingles); adult colouring is orange, brown and yellow (Pritchard and Mortimer 1999, SWOT Scientific Advisory Board 2011). They can grow up to 95 cm, with a weight of 85 kg. In Solomon Islands, curved carapace length (CCL) for adult females has been averaged at 84.6 cm (range: 60 cm–97.5 cm) (Vaughan 1981).

Adults feed primarily on sponges (Meylan 1988, Spotilla 2004), but will also graze on zoanthids and corallimorphs (von Brandis 2014). Following hatching, it is postulated that they swim to the open ocean and stay among drifting seaweed for about one to three years before moving to live on coral reefs, but can also be found on rocky outcrops, seagrass beds, within mangrove bays and in lagoons with mud bottoms (Spotilla 2004).

Female hawksbills reach sexual maturity between 14 and 24 years (Levasseur 2021) and in Solomon Islands lay around 4–5 clutches each season (Mortimer 2002), with an average of 151 eggs per clutch (range: 37–234) (Vaughan 1981). Some females lay clutches in the same year at different islands up to 8.5 km apart, and the remigration interval for a nester is between 5 and 6 years (Hamilton et al. 2021). Hatching success varies greatly between areas, with sites in Australia up to 90 per cent and in the eastern Pacific between 52 and 72.3 per cent (Pilcher 2021). In the Arnavons, Vaughan (1981) reported 81.7 per cent (range: 30–100 per cent), with hawksbills nesting throughout the year, although the main peak is between May to July (with a secondary peak in December and January) (Hamilton et al. 2015).

Distribution

Hawksbills can be found in the waters of 108 countries, with nesting occurring in 70 of these (Mortimer and Donnelly 2008). In the southwest Pacific RMU, hawksbills migrate between Solomon Islands, Papua New Guinea, New Caledonia and Australia (Hamilton et al. 2021, Pilcher 2021). In a recent study by Hamilton et al. (2021), satellite tracked hawksbills from ACMP travelled to foraging grounds on the Great Barrier Reef (GBR) in Australia, while Bell et al. (2018) found that 83 per cent of the females found foraging in the Howick group of islands in the GBR were from nesting beaches in the Bismarck–Solomon Sea region. Tagged females from ACMP have also been recovered from Fisherman's Island, in Papua New Guinea (Trevor 2009).

Within Solomon Islands, the Arnavon Islands is the most important site for hawksbills, being the largest rookery in the oceanic southern Pacific (Hamilton et al. 2021). However, hawksbills are found to nest and/or forage in several sites within the country, and although not to the extent of the Arnavons, their protection is warranted given the critically endangered status of this species (as long as the effort invested has a tangible benefit to the population). A list of historical and current hawksbill sites can be found in Table 1.

Status

Hawksbill turtles are listed as critically endangered under the International Union for Conservation of Nature's (IUCN) Red List and listed on Appendix I of the CITES convention. Most population estimates for hawksbills, as with all turtles in Solomon Islands, is derived from the number of nests per year (i.e. excluding the number of juveniles and males, and not always taking into account re-nesting) (Table 1). In the Arnavons in the 1970s, nesting numbers

Hawksbill turtle. Photo: Noel Lopez © WCS

varied between 560 and 600 nests per year (McKeown 1977, Vaughan 1981), and Pita and Broderick (2005) reported that 679 nests were laid in 1992 (attributed to 239 turtles); in 1995, 599 nests by 206 females; and in 2000, 785 nests by an estimated 270 females. More recent observations by Hamilton et al. (2015) have shown that despite the near collapse of the population by the 1990s from 150 years of commercial harvest, figures from the Arnavons from the early 1990s to 2012 show a doubling of nests laid since the establishment of the ACMP (see section *Research and management initiatives*).

On Kolombangara Island, to the south of the Arnavons, the waters surrounding the island appear to be an important foraging ground for juvenile hawksbills, with 105 juveniles captured and tagged in 2013–2014 (Esbach et al. 2014). Hawksbills have also been observed nesting on the island (Dr Alec Hughes, pers comm.), although numbers are unknown. Most data for other nesting sites in Solomon Islands are from the pre-2000s, yet still provide an important baseline. Estimates for these sites can be seen in Table 1.

Leatherback turtle (*Dermochelys coriacea*)

General

Leatherbacks are the largest of all the world's marine turtles weighing around 400 kg – 500 kg (Davenport et al. 2011) and have been recorded up to 184.9 cm CCL in Solomon Islands (Trevor 2009). Leatherbacks have no scutes, but rather a flexible, leathery, strongly tapered carapace made up of small bony plates, and their overall colour is predominantly black, covered with small white or pale spots (Pritchard and Mortimer 1999). Their jaw is deeply notched with a mouth full of backward facing, relatively soft spines to lock onto their prey. The diets of leatherbacks consist mostly of gelatinous zooplankton (e.g. medusae, siphonophorae and salpidae) which, being poor in energy, requires them to eat huge amounts (Okuyama et al. 2021). While they are predominately oceanic-pelagic throughout their life-history, sub-adults and adults do forage in coastal waters occasionally (Jones and Seminoff 2013). In Solomon Islands they have been recorded foraging around the Kavachi submarine volcanic seamount (Jino et al. 2018).

In Solomon Islands the peak nesting season is from November to January with further nesting from May to July (Jino et al. 2018). Females

[5] Tetepare Descendants Association

Table 1. Hawksbill turtle historical and current nesting and foraging sites and estimated numbers in Solomon Islands (see Figure 1 for locations)

Site/Island	Nesting/ foraging	Estimated numbers of nests or foragers/year	Source
Arnavon Islands	Nesting	1,000-1,500	Hamilton et al. (2015); Madden Hof et al. (2022)
Shortland Islands	Nesting	400-500 nests	Vaughan (1981)
		Bagora/Obeani Is.: 50-100 nests	Wilson et.al (2004)
Ramos Islands	Nesting	50-100 nests (combined with green turtles)	Vaughan (1981)
Choiseul Islands	Nesting	230-450 nests (mostly on Haycock and Wagina Islands)	Vaughan (1981)
Tetepare Island	Foraging	12 tagged while foraging in 2004-2008 5 nested between 2005-2007	Tetepare Descendants Association (TDA), unpublished data
Makira	Nesting	~50-100 nests (combined with green turtles)	Vaughan (1981)
Russell Islands	Nesting	50-100 nests	Wilson et. al (2004)
Hele Bar islands (Marovo)	Nesting	50 nests	Wilson et. al (2004)
Santa Cruz	-	50-200 nests	Wilson et. al (2004)
Kolombangara	Foraging	105 juveniles tagged in 2013-14	Esbach et al. (2014)
Ngalo Island	Nesting	No data [4]	Ceccarelli (2018)
Ontong Java Island	-	No data	Ceccarelli (2018)
Cross Island (Gizo)	Nesting	No data	Vaughan (1981)

[4] *No data means that only presence information was mentioned.*

Leatherback turtle. Photo: Alec Hughes © WCS

in the western Pacific lay a mean clutch of 95 eggs (ranging from 66 to 124 eggs) (Work et al. 2020), favouring black sand to lay their eggs. On Tetepare and Rendova islands in Solomon Islands, average clutch size between 2018 and 2021 was 76.8 eggs (TDA[5] unpublished data). Clutch frequency varies by location, with up to four per year in Australia and 2.2–2.9 in Papua New Guinea (Pilcher 2021). Jino et al. (2018) found one satellite tracked female to emerge five times in eleven days on Vangunu Island in Solomon Islands. On Rendova, clutch frequency averaged 1.5 (1–8) over the 2019–2020 and 2020–2021 peak seasons (TDA unpublished data).

Hatching success likewise varies across the western Pacific, in Indonesia, varying from 9.3 to 44.7 per cent and from 37 to 87 per cent in Papua New Guinea (Pilcher 2021). Since 2018, on both Tetepare and Rendova islands, hatching success for in situ nests averaged 46.6 per cent and in hatchery-incubated nests averaged 51.6 per cent. (Masakolo et al. 2022). Hatchery experiments by Tapilatu and Tiwari (2007) found hatching success in a hatchery can be increased to 70.5 per cent through shading the hatchery in sites where sand temperatures are above the thermal tolerance of the embryos. The low success rate on Tetepare and Rendova in the hatchery may be due to the temperature profiles not matching natural nests i.e. too hot. Surveys by Zaira Rangers on nearby Vangunu Island found temperatures within hatchery nests to be 1.5°C higher than the natural nests (Jino et al. 2018). If this is the case for Tetepare and Rendova islands, some of the embryos may be 'cooking' in the nest chamber, hence the low survival.

Distribution

Leatherbacks found in the Solomon Islands RMU nest predominately in Indonesia, Papua New Guinea and Solomon Islands, while they migrate and feed in Malaysia, Philippines, Australia, Japan and across the Pacific to Hawaii and North America (NOAA 2021, Pilcher 2021). Tagging data and satellite tracking surveys have found leatherbacks from Indonesia and Australia migrating through Solomon Islands,

moving to and from California and foraging also in Fiji (Benson et al. 2011, Jino et al. 2018). Community rangers on Rendova Island reported finding leatherbacks with tags from Samoa and New Caledonia (TDA unpublished data).
While juvenile leatherbacks have not been recorded in Solomon Islands, adult females do nest on a number of beaches throughout the country (Anon. 2009) (Table 2), and Solomon Islands is considered one of the main nesting sites for the western Pacific Ocean population of leatherbacks (NOAA 2016). While islands such as Isabel, Tetepare and Rendova are likely to have the most nesting females, all sites are worthy of protection given the critically endangered status of this species.

The global population of leatherback turtles is listed as vulnerable under the IUCN Red List, while the western and eastern Pacific populations are classified as critically endangered (Wallace et al. 2013a, 2013b; Tiwari et al. 2013). All leatherbacks are listed on Appendix I of the CITES convention. Since the 1980s there has been an 80 per cent decrease in the western Pacific populations (NOAA 2021) because of threats such as nest predation (Hitipeuw et al. 2007), harvesting of eggs and meat (Tapilatu et al. 2013), by-catch (NOAA 2021) and flooding of nests (Masakolo et al. 2022; Jino et al. 2018; NMFS and USFWS 2020).

On the unhabituated island of Tetepare, community rangers from TDA have been monitoring leatherback nests since 2002 and recorded an average of 28 nests per year, up until 2020–2021 (Figure 3). On the nearby island of Rendova, 95 nests were recorded on average annually between 2002 and 2021 (Figure 3). If just the last three years are averaged (2019–2021), an upward trend can be observed with 165 nests being recorded annually. From this data, an estimate of nesting female abundance for the two islands combined has been calculated as 119–376 females (using the average number of nests since 2018–2021 [the most recent uninterrupted time series], clutch frequency of 1.5–5, and remigration interval of 3 years). This is considered quite an underestimation, as effort over those years has differed, and more consistent data is needed to refine this figure.

Also in Western Province, on Vangunu Island, up to 50 leatherback nests per year were laid until the 1980s, but rapidly declined in 1990s according to anecdotal evidence (Jino et al. 2018). From 1999 to 2010, although several nests were laid in each of these years, no successful hatching events occurred. Following construction of a hatchery by community rangers in 2011, 23 nests from 11 leatherbacks were recorded between then and 2014 with an average hatching success of 66.8 per cent. Since that time however, monitoring of nests has been sporadic with only 12 nests recorded from August 2018 to January 2021 (Zaira community, unpublished data).

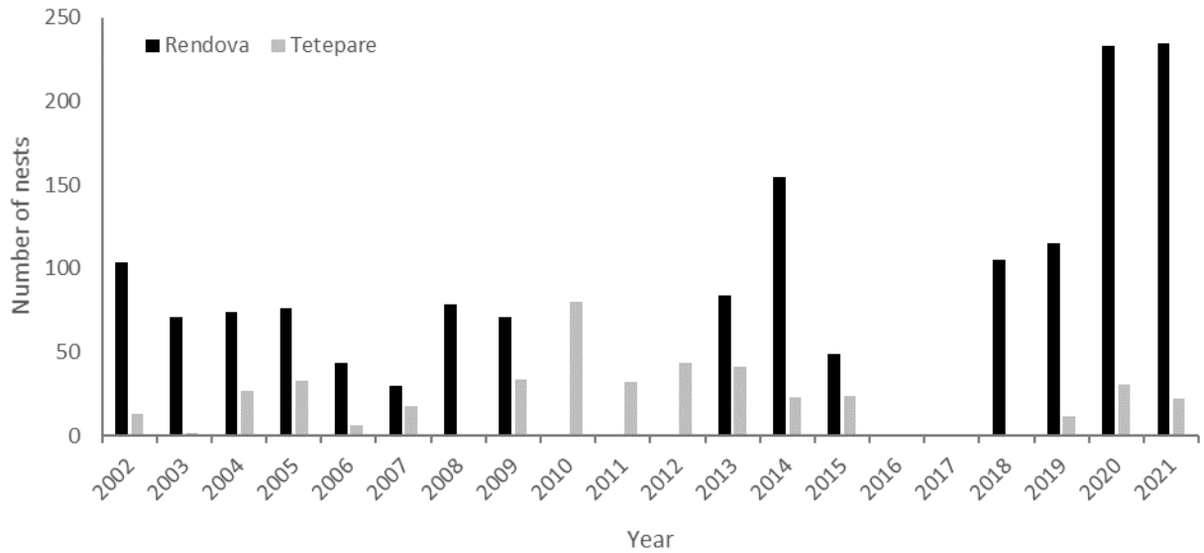
Further north, on Isabel Island, the beaches of Haveo, Sasakolo, Sosoilo, Lilika and Litoghahira are also considered important nesting sites for leatherbacks (Mast et al. 2006, Peterson et al. 2012, NMFS and USFWS 2020). The Nature Conservancy's (TNC) most recent surveys with communities' in Haveo, Sasakolo and Sosoilo have revealed positive results, especially for the former two beaches, with over 80 nests on each beach in the 2021/2022 nesting season (Table 2). The numbers for Sasakolo and Sosoilo in Table 2 are considered an underestimate, as monitoring requires more consistency (TNC's Dr Peter Waldie, pers. comm). TNC is yet to commence monitoring at Litoghahira, and so data for this site is historical only (Table 2). Data for Lilika is also historical, with only rough estimates of 150 nests per year given (Mast et al. 2006).

In Mbota Community, on the southeast side of Guadalcanal, locals estimate 32 nestings between July 2017 and February 2018 (Aram et al. 2021). Other sites also have limited information on the current number of nesting females, although some data does exist. This includes Vacho River on Choiseul Island with an estimated 50 nests per year in 2004 (NMFS and USFWS 2020) and on Malaita Island where seven leatherbacks were reported nesting in 2015 on Waisurione Beach, two of which were recaptures (Marine Research Foundation 2015).

Table 2. Leatherback turtle historical and current nesting and foraging sites and estimated numbers in Solomon Islands (see Figure 1 and Figure 2 for locations).

Site/Island	Nesting/ foraging	Estimated numbers of nests or foragers/year	Source
Isabel Island • Haevo • Sasakalo • Sosoilo • Litoghahira • Lilika	Nesting/ foraging	Av. 115 nesting events*, 97 nestings across 2020/21 & 2021/22 seasons (Haevo) 87 nesting events, 80 nestings, 2021/22 (Sasakalo) Av. 16 nesting events, 12 nestings across 2020/21 & 2021/22 seasons (Sosoilo) 650 (2007), 315 nests (2011) (Sasakolo and Litoghahira combined) 150 nest (Lilika)	Dr Peter Waldie (pers. comm) NMFS and USFWS (2020) Mast et al. (2006)
Tetepare Island • Qeuru • Tirokofi • Tofa	Nesting	Av. 28 nests (2002-2021) Av. 21 nests (2019-2021) (beaches combined)	TDA, unpublished data
Rendova Island • Mbaniata • Havila • Retova • Toritoro	Nesting	Rendova Island Mbaniata Havila Retova Toritoro	TDA, unpublished data
Vangunu Island (Zaira beach)	Nesting	50 nest (up until late ‘80s) 23 nests (2011) 12 nests (2018-2021)	Jino et al. (2018) Zaira community unpublished Data
Malaita Island (Waisurione Beach)	Nesting	7 nests (2015)	Marine Research Foundation (2015)
Guadalcanal Island (Mbota Community)	Nesting	32 nests (2017-2018)	Aram et al. (2021)
Choiseul Islands (Vacho)	Nesting	50 nests (2004)	NMFS and USFWS (2020)
Marovo Lagoon	Nesting	No data	Ceccarelli (2018)
Makira (San Cristobel) Island	Nesting	No data	Anon (2009)
Ontong Java	-	No data	Ceccarelli (2018)

Figure 3. Number of leatherback nests on Tetepare and Rendova Islands from 2002 to 2021. Those with no data were times when surveys were not undertaken or records lost (TDA, unpublished data). *Includes only January-March 2021 data.



Green turtle (*Chelonia mydas*)

General

The name 'green' refers to the greenish colour of the turtles' fat, owing to their diet of seagrass and algae. The green turtle's carapace can be light or dark brown with sometimes olive shading and a yellow-white plastron (Pritchard and Mortimer 1999, Spotila 2004). Adults range from 65 kg to 204 kg, with a CCL of 80 cm to 122 cm (Spotila 2004). In Solomon Islands, the mean CCL of nesting females has been recorded as 85 cm (range: 78 cm–-89 cm) on Kerehikapa (McKeown 1977); much smaller than the 110 cm recorded by both Vaughan (1981) on the same island and by Community Rangers on Tetepare Island (TDA unpublished data). While predominantly herbivorous, dieting on seagrass and algae (Bjorndal 1985), they are known to also feed occasionally on jellyfish, salps, sponges, molluscs and fish (Esteban 2020). Community Rangers on Tetepare report green turtles commonly foraging amongst the abundant seagrass beds that surround the island (Argument et al. 2009). Like other marine turtles, green turtle hatchlings spend their first several years in an oceanic habitat before moving to more coastal, shallow water foraging habitats (Bowen et al. 1992), although they will migrate through the oceanic zone during migrations from foraging area to breeding sites (Plotkin et al. 2002).

Green turtles take the longest time than any other marine turtle to sexually mature, presumably because of the low protein diet (Spotila 2004), taking from around 26–40 years to reach maturity (Seminoff 2004). Clutch frequencies per year for green turtles in the southwest Pacific vary around 4–5 (Pilcher 2021) and in Solomon Islands, on Tetepare Island clutch sizes averaged 99 eggs (ranging from 55 to 134 eggs) (TDA unpublished data). Hatching success on Raine Island in Australia's northern GBR, the world's largest green turtle rookery, was 74.45 per cent in 1979 and 79.58 per cent in 1984 (Limpus et al. 2003), but in the 2018–2019 nesting season had reduced to 62.5 per cent (Booth et al. 2021). In Solomon Islands, average hatching success on Tetepare from nine nests in 2019–2021 was 29.9 per cent ; nesting appears confined to the months of August to March (TDA unpublished data).

Distribution

Green turtles are distributed globally throughout the tropics and, to a lesser extent, in the subtropical waters (Seminoff 2004). The southwest Pacific RMU for green turtles includes Australia, New Caledonia, Vanuatu and Solomon Islands (Pilcher 2021), although greens tagged on Bikar Atoll in Marshall Islands and in Bougainville and Morobe

Green turtle. Photo: Robert Howard © WCS

Provinces in Papua New Guinea, have been recovered in Solomon Islands (Trevor 2009), and a green turtle tagged in French Polynesia was found in Malaita (McKeown 1977). The IUCN's Marine Turtle Specialist Group uses 32 index sites to assess the global status of green turtles (Seminoff 2004), absent from the list is Solomon Islands. Although they are frequently observed in the country, it is likely that they use the area mainly for foraging. McKeown (1977) observed that no green turtle rookeries (nesting in aggregations) were found in Solomon Islands but noted many places with occasional nesting. Within Solomon Islands, greens have been recorded nesting and/or foraging across the archipelago as detailed in Table 3.

Status

Green turtles are listed as endangered on the IUCN Red List and listed in Appendix I of the CITES convention. Data for green turtles in Solomon Islands is quite limited; most is historical and can often be intermixed with hawksbill data. Nonetheless it still provides a useful baseline, even if just as estimates. Mortimer (2002) stated that green turtle nesting in Solomon Islands in the three decades prior to 2002 had been low but was unable to deduce if this was due to centuries of harvest or not. Broderick (1998) stated that Solomon Islands was important for juvenile green turtles as developmental habitat but that most were being harvested.

In terms of nesting, while numbers are considered lower than the two former species, green turtles use islands across the Solomon Archipelago (Table 3). Maison et al. (2010) estimated between 80 and 700 annual nesting females in Solomon Islands, with the trend unknown. Green turtles also use several sites for foraging, most notably around the Arnavons, Kolombangara island, Tetepare Island and within the Marovo lagoon (Table 3). Surveys on foraging appear to be less frequent, and as such, numbers could be considered an underestimate.

Loggerhead turtle (*Caretta caretta*)

General

Loggerhead turtles, as the name suggests, have a very large head and strong jaws (Guzman 2010); they have a reddish-brown carapace and yellow to brown plastron (Pritchard and Mortimer 1999); adult CCL vary from 85 cm to 124 cm

Table 3. Green turtle historical and current nesting and foraging sites and estimated numbers in Solomon Islands (see Figure 1 and Figure 2 for locations).

Site/Island	Nesting/ foraging	Estimated numbers of nests or foragers/year	Source
Isabel Province (not including the Arnavons)	Nest	Estimated 259-438 nests (1989)	Leary and Laumani (1989)
Arnavon Islands	Nest/forage	45 nests 165 captured foraging in 1994-1996	Vaughan (1981) Argument et al. (2009)
Hakelake Island	Nest	15-20 nests	Vaughan (1981)
Shortlands Islands • Ausilala* • Maifu • Balaka	Nest	100 nests in Ausilala and Maifu each (no data for Balaka)	Vaughan (1981)
Ramos Islands	Nest	50-100 nests (intermixed with hawksbills)	Wilson et al. (2004)
Tetepare Island	Nest	Av. 5.3 nests (2019-2021) 240 tagged while foraging in 2004-2008	Tetepare Descendants Association (TDA), unpublished data
Wagina Island	Nest	10-15 nests	Vaughan (1981)
Hele Bar Islands	Nest/forage	Approx. 50 nests harvested in 2021	Dr Alec Hughes (pers. comm)
Kolombangara Island	Nest/forage	No data	Work et al. (2020)
Marovo Lagoon	Nest/forage	No data	Work et al. (2020)
Edward Banks	Forage	No data	Vuto et al. (2019)
Reef Islands	Nest	No data	Ceccarelli et al. (2018)
Russell Islands	Nest/forage	No data	Ceccarelli et al. (2018)

** Absent from Figure 1, Vaughan (1981) states it is two small islands on the border with PNG.*

Loggerhead turtle. © TierraMar Photography/Anissa Lawrence

and weigh between 80 kg and 200 kg (Spotila 2004). Loggerheads are considered to have a generalist diet, feeding on gastropods, bivalves, echinoderms, cephalopods, polychaets, sponges, anthozoa and crustaceans, just to name a few (Jones and Seminoff 2013). As with other marine turtles, hatchling loggerheads will head to the open ocean and spend over a decade there before heading back to neritic waters, where they will inhabit lagoons, estuaries and river mouths to mature and eventually reproduce (Dodd 1988, McClellan and Read 2007). It appears unlikely that loggerheads nest within Solomon Islands and no information on their nesting behaviour exists for the country.

Distribution

Loggerhead turtles are distributed globally from subtropical to temperate regions of the Pacific, Indian and Atlantic Oceans and the Mediterranean Sea (Limpus and Casale 2015). Breeding sites for the South Pacific subpopulation are concentrated on the east coast of Australia and in New Caledonia (Limpus and Casale 2015). Tagged females in Australia have been found in Papua New Guinea and New Caledonia (Trevor 2009) and studies have shown a genetic relationship with loggerheads in Australia and South America (Pilcher 2021). However, there appears to be no information on the interaction of the loggerheads that inhabit Solomon Islands and other countries in the region.

In Solomon Islands, the number of nesting or foraging sites for loggerheads appears small, if any, in the case of nesting. Loggerheads have been reported on Ontong Java (Crean 1977), but it is unknown if this was foraging or nesting, and McKeown (1977) reported two individuals caught off Wagina Island, and that villagers noted that they find loggerheads foraging on deep reefs, but do not nest. McKeown (1977) also reported them to be found in the Nupani islands.

Status

The global population of loggerhead turtles is listed as vulnerable on the IUCN Red List, while the South Pacific subpopulation is classified as critically endangered (Limpus and Casale 2015, Casale and Tucker 2015). All loggerheads are listed in Appendix I of the CITES list. Casale and Tucker (2015) note that while the abundance of the South Pacific subpopulation is yet to be assessed, the number of females nesting annually is less than 700. For Solomon Islands, other than the number of records mentioned above under Distribution, their status in the country is unknown.

Olive ridley turtle © Getty Images

Olive ridley turtle (*Lepidochelys olivacea*)

Olive ridley turtles have an olive-green carapace with a creamy yellow plastron and the species is one of the smallest marine turtles averaging 60 cm–70 cm CCL and are rarely over 50 kg (NMFS and USFWS 1998). They feed predominantly on gastropods and malacostracans (Jones and Seminoff 2013) but are also known to eat tunicates, jellyfish and algae (Department of the Environment 2021). Unlike most of the marine turtles, this species will spend most of its non-breeding life cycle in the open ocean and only inhabit neritic zones during mating and nesting, although some mating does occur in oceanic waters (Lutz et al. 2003).

Female olive ridley turtles take around 10 to 18 years to sexually mature (Zug et al. 2006). They are mostly known for their large nesting aggregations (arribada) (Fonseca et al., 2009). In Australia, they lay approximately 109 eggs[7]. Hatching success of olive ridleys in northern Australia has been recorded at 84.7 per cent (Whiting et al. 2005). Information on the nesting behaviour of olive ridleys in Solomon Islands is limited with only a few reports of nests on Maliata (Namo et al. 2018) and Makira (Vuto et al. 2019).

Distribution

Olive ridley turtles are found worldwide, predominately in tropical waters, with some migration through subtropical areas; nesting is known to occur in 60 countries (Abreu-Grobois and Plotkin 2008). Most nesting is confined to the west coast of central America and between the Bay of Bengal in Southeast Asia and Australia (Abreu-Grobois and Plotkin 2008). Solomon Islands and greater Melanesia does not appear to be a principal foraging or nesting site for this species. In Solomon Islands, olive ridleys have been recorded in Guadalcanal (near Honiara), on Wagina and Makira Islands, where hatchlings were photographed on Waihaoru beach (McKeown 1977; Vuto et al. 2019) and hatchlings were also observed on Malaita Island by the Wai-Hau Rangers (Namo et al. 2018).

Status

Olive ridley turtles are listed as vulnerable on the IUCN Red List (Abreu-Grobois and Plotkin 2008) and listed in Appendix I of the CITES convention. Given the paucity of observations of this species in Solomon Islands their status or estimated number remains unknown.

[7] http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1767

Cultural Value and Uses of Marine Turtles


Björn Svensson © WCS

For centuries, marine turtles have played an important role in the lives of people from Solomon Islands; they feature in their oral traditions and ethno-zoological knowledge, and bones of turtles have even been found in the oldest archaeological digs in Solomon Islands, dating back 3,000 years (McKeown 1977). Marine turtles can be seen in carvings and other forms of artwork of coastal communities and there are numerous legends and myths about turtles that 'paint colorful stories in the history of Solomon Islands' (Masolo and Ramohia 2016). Given the number of tribes in Solomon Islands, there are over 20 different names just for 'turtle' and around 50 names when describing the species (see McKeown 1977, Appendix 1 for a full list of these names).

On Bellona Island, there was a close traditional affinity between people and turtles as described in this story collected from the island by Kuschel (1975), where turtles were considered to be like humans because of the amount of blood in their body:

"*The green turtle was a human being. People want to swim and they pushed the turtle into the ocean where it sank, becoming something belonging to the ocean. It just stayed and lived in the ocean and became a fish*[8]*, but originally it was a human being. When it was pregnant it came back ashore here. It dug a hole, laid its eggs into it and went back to the ocean. The turtle is like this; a person which went and fell into the ocean and became a fish; but it thinks about returning to the seashore to find an island home. When it is pregnant it comes ashore, lays its eggs and returns to the sea. This is the ending*".

On Bellona the green turtle was rarely seen and before Christian times was seen as a gift from Tehainga'atua, the sky god (Kuschel 1975).

Masolo and Ramohia (2016) describe how turtle meat and eggs is considered a delicacy and used for special occasions and the shell and oil for other cultural uses. For example, in South Malaita, in Are' Are, the shell of the turtle is used as money in addition to traditional jewellery such as earrings, bangles and rings (although this has led to the overexploitation of marine turtles, namely the hawksbill, to supply growing markets in Asia). Through their hunting of marine turtles however, Solomon Islanders have amassed a wealth of knowledge on their ecology, such as their foraging and nesting sites, and which are the fattest turtles (Anon 2009), and this knowledge is being used today in the conservation of the species.

[8] Kuschel (1975) notes: *Bellonese classify the turtle as a fish, "because it is a part of the ocean".*

Threats to marine turtles in Solomon Islands

As noted earlier, all species of marine turtle which inhabit the waters of Solomon Islands are listed on the IUCN Red List as either vulnerable, endangered or critically endangered. This is due to a range of mostly anthropogenic impacts threatening their survival, including harvesting of eggs and meat, wildlife trade, plastic pollution, coastal development, fisheries by-catch and climate change (Wallace et al. 2011, Mazaris et al. 2017, Vuto et al. 2019, Jino et al. 2018, Pilcher 2021). Understanding these threats is key to designing the most effective conservation strategies, as each impacts different life stages of turtles, and this can mean weighing up which strategy to use when resources are limited. As Pilcher (2021) notes, saving a reproductive female (e.g. from by-catch) may be more important than protecting a few eggs (e.g. from poaching). Quantitative information on the impact of threats in Solomon Islands is however, limited, except in the case of harvesting and nest inundation from flooding, and will therefore be a key component to address in the Solomon Islands 5-year National Plan of Action – Marine Turtles, 2022–2026. Below is an overview of the main threats facing marine turtles in Solomon Islands, with quantitative information provided where available.

Fisheries by-catch

By-catch is the incidental capture of marine turtles by fishers targeting other species (Wallace et al. 2011) and occurs across all levels, from small scale fisheries (SSFs) to large commercial bottom trawling and longline vessels (Hamann et al. 2010). In a global assessment of the five main threats to marine turtles (including by-catch, take, coastal development, pollution and pathogens and climate change), by-catch was ranked the highest threat (Wallace et al. 2011).

In Solomon Islands, quantitative data on marine turtle by-catch is limited to the Marine Stewardship Council (MSC) certification assessment of two of the main fisheries in Solomon Islands and the Ministry of Fisheries and Marine Resources (MFMR) annual reports to the WCPFC. The skipjack and yellowfin purse seine anchored Fish Aggregating Device (FAD) and pole and line fishery received MSC certification in 2016 (MSC-F-30002) and the Longline Tuna Fishery in 2019 (MSC-F-31452) (see www.fisheries.msc.org). Both require the fishery to use gears that reduce by-catch of turtles, such as large circle hooks in the long-line vessels (Morison et al. 2019). Trials in 2014 reported that for every 41,300 hooks laid, one turtle was caught (vessels set between 2,500 and 3,000 hooks per day) (Morison et al. 2019). In these trials, species caught included olive ridley, leatherback, green and flatback turtle[9]. In the purse seine anchored FAD and pole and line fishery assessments, 1–2 olive ridleys were caught each year (over 5 years) and less for greens. It should be noted however that in purse seine fisheries, captures and mortality is very low for marine turtles (Molony 2007, Hall and Roman 2013). Given these results, the assessment team stated the "fishery does not hinder the recovery of marine turtles, given the small numbers and the low rate" (Trumble and Stocker 2016). In MFMR's reports to WCPFC (MFMR 2021), actual numbers are grouped under 'marine reptiles' (Table 4), which could either be turtles or sea snakes. However, catches in kilograms are provided for marine turtles (Table 4).

While these numbers are encouragingly low, it must be highlighted that this is only for two types of certified fisheries. Absent from the literature is information on by-catch from SSF or even data on the number of vessels operating in this space. This is, however, not unique to Solomon Islands. A global review by Wallace et al. (2010b) noted a lack of reports on by-catch from SSF, stating that this data is critical in understanding the true impact of by-catch on marine turtles. Marine turtles are considered susceptible to by-catch in SSF due to overlapping use of coastal waters (Peckham et al. 2007). For example, combined data from SSF fisheries in Ecuador, Chile and

[9] As noted above, this is the only record of a flatback turtle in Solomon Islands, with only one individual being caught.

Table 4. Annual catches of marine reptiles and annual catches of turtles in kilograms by national purse seine and longline fleet in the WCPFC Convention area for 2016–2020 (MFMR 2021) (- denotes where no data was provided).*

Gear	Species Category	2016	2017	2018	2019	2020
Number caught						
National Purse Seine	Marine reptiles	13	10	14	6	1
National Longline Fleet	Marine reptiles	1	-	9	4	-
Kilogram pf species caught						
National Purse Seine	Turtles	20kg	76kg	-	30kg	126kg
National Longline Fleet	Turtles	80kg	-	510kg	40kg	-

**Note: kilogram of species was converted from metric tonnes provided in MFMR (2021).*

Peru estimated annual mortality at 16,234 turtles from gillnet fisheries (Alfaro-Shigueto et al. 2018). The impact SSF could be having on marine turtles in Solomon Islands is therefore a large knowledge gap and, given that 80 per cent of households[10] in the country report to be involved in fishing (although variable in space and time) (Cohen et al. 2015), mortality of marine turtles by SSF could potentially be quite high. Albert et al. (2015) did however find that most time spent fishing by communities in Roviana lagoon was through handline fishing, with nets used less than 16 per cent of the time. Yet, even if the use is low, Giskes et al. (2019) report that gillnets have the highest risk of loss compared to other gears (such as traps, hooks and line, bottom trawls) and were considered to cause the most harm to the environment (as ghost nets).

Like SSF, there is also no data available on by-catch of marine turtles in non-certified commercial fisheries, especially for non-certified fisheries boats illegally fishing in Solomon Islands EEZ (i.e. illegal, unregulated and unreported fisheries [IUU]). This also amounts to a large knowledge gap on the impact of this threat on marine turtles in Solomon Islands, especially reproductive females.

Community Consumption

Vuto et al. (2019) undertook a comprehensive assessment of marine turtle harvest in Solomon Islands and found that approximately 9,473 turtles are harvested annually. Most were caught by spearfishers freediving at night. In their assessment, harvest was found to be dominated by green (73.8 per cent), followed by hawksbill (25.7 per cent) and olive ridley (0.5 per cent). The catches of greens and hawksbills were dominated by immature turtles and the authors note the low number of adults caught suggests an unsustainable fishery. Adults were more likely caught on or near nesting beaches. In the last ten years, Buala spearfishers have started traveling as far out as the Edward Banks (Figure 1), off Isabel Island to harvest marine turtles. The highest catches were recorded in Kia community in Isabel Province and on Wagina Island in Choiseul Province (Figure 1). Most of the catch was for subsistence purposes, with 88.2 per cent for greens being consumed by the fisher's family and 81.6 per cent for hawksbills (with most of the remainder sold). The study did not record take of turtle eggs.

Argument (2009) noted that harvesting of eggs in the Hele Bar Islands was impacting the nesting success of green turtles but no quantitative figures were given. Mackay (2005) reported that before the 2002 project on Tetepare Island, to protect leatherback nests, almost all eggs (and at least ten adult turtles per year) were consumed. More recently, Dr Alec Hughes (pers. comm) noted that communities in Western Province regularly harvest turtles for social events, such as church programmes, weddings and birthdays.

[10] The 2019 national census reported 124,247 households from a population of 721,455 people (www.statistics.gov.sb).

In Marovo lagoon, turtles are sometimes called the pigs of the sea, referring to the ease with which turtles can be harvested and consumed en masse. For instance, during November to December in 2021, approximately 50 nesting green turtles were reportedly harvested from the Hele Bar chain of Islands. Similar levels of harvesting are also reported for the northern end of Marovo lagoon.

Wildlife trade

As noted above, marine turtles have played an important role in the cultural and economic lives of Solomon Islanders. However, economic drivers have placed huge pressures on marine turtles, especially hawksbills, with commercial markets and trade routes dating back to the 1840s (Vuto et al. 2019). While turtle trade in Solomon Islands was banned in 1993 by the MFMR, subsistence harvesting of turtle meat is allowed for all species, except leatherbacks (see Fisheries Management [Prohibited Activities] Regulations 2018 above).

Despite the ban however, marine turtle products are still being sold, with thousands of turtles harvested each year in Solomon Islands. This relates mostly to the hawksbills, whose beautiful shell is highly prized by traders. For centuries, the shell was sold and made into jewellery, used for traditional medicine and ornaments for tourist souvenirs (LaCasella 2021). Vuto et al. (2019) noted that between 1840 and 1900 thousands of hawksbills were traded with European whalers, and after World War 2, the bekko trade (trade of hawksbill carapace) boomed, with large exports heading for Japan. In the late 1980s, over 4,000 hawksbills were being killed each year and sent to Japanese markets. This prompted the 1993 ban (noted above), as hawksbill numbers were declining rapidly. While most of the catches reported in Vuto et al. (2019) were for subsistence, 24.2 per cent of hawksbills were sold for their shell, nearly all of which were from Wagina community. Recent mitochondrial DNA profiling of hawksbill products in markets in Papua New Guinea – in Rabual, Kavieng and Port Moresby – shows that these originated from Solomon Islands stock (LaCasella 2021). The same study also found hawksbill shell jewellery for sale in Honiara, in the Central Market, Ladies Market and at the Kitano Mendana Hotel.

In Western Province, in the more urban locales such as Munda and Gizo, marine turtles are commonly harvested for sale to locals and Asian businesses (Dr Alec Hughes, pers. comm). The limited level of active enforcement of national fisheries regulations protecting turtles has promoted complicit behaviour as fishers tend to ignore these regulations.

Climate Change

As with most species and ecosystems, climate change will have, and is having, direct and indirect impacts on marine turtles through increased temperature, rises in sea levels and more intense and frequent cyclones (Fuentes et al. 2011, NOAA 2021, Patrício et al. 2021). Increased temperatures in the nest can impact embryo development, leading to reduced fitness of hatchlings or death, and, as the sex of marine turtles is temperature dependent, a warming climate can feminise the population (Howard et al. 2014) and reduce fertility rates (Hamann et al. 2010). Rising sea-levels is leading to loss of nesting beaches through beach erosion, and nests are becoming inundated with sea water because of flooding, which will be compounded by more frequent storms (Varela et al. 2019).

In Solomon Islands, annual maximum temperatures in Honiara have increased by 0.15°C per decade since 1951 and are expected to increase. Sea levels have risen by approximately 8 mm per year since 1993 (more than the global average of 2.8 mm–3.6 mm per year) and are expected to continue to rise by 4 cm–15 cm by 2030 (Pacific Climate Change Science Program 2011). The number of cyclones is expected to decrease, however there is a predicted increase in the proportion and intensity of severe storms. The more intense storms and tides have already been felt in Solomon Islands, with beachfront erosion and home gardens inundated with saltwater (Peterson et al. 2012, Foale et al. 2017). A study of shoreline loss from 1947 to 2014 in Solomon Islands found 11 islands in the north had totally disappeared or were suffering severe erosion (Albert et al. 2016). On Vangunu Island in Western Province, Community Rangers report that traditional nesting sites have been compromised by coastal erosion that is steeping the backshore (Jino eta al. 2018). The same is being reported on Arnavons, Tetepare and Hele Bar Islands (Albert et al. 2016, Foale et al. 2017).

Hawksbill turtle © Kenneth Kassem

On Rendova Island, in 2021 some nests were lost before Community Rangers could move the eggs to a hatchery (Eddie 2021). Nests at Waisurione beach on Malaita have also been impacted from unusually higher tides; in June 2015 many nests became inundated with water and staff reported "large scale erosion of the nesting beach" (Marine Research Foundation 2015).

To mitigate the risks from erosion and flooding, Community Rangers have been moving leatherback nests to hatcheries, which has proven successful on both Rendova and Tetepare, with 543 nests saved and moved to hatcheries from 2018 to 2021 (TDA unpublished data). Eleven nests in 2020–2021 not relocated, were flooded. However, as noted above, survival in the nest and sex-determination in turtles is governed by temperature, meaning hatcheries must be carefully managed to ensure they are mimicking natural conditions. Surveys by Zaira Rangers on Vangunu Island found temperatures within leatherback turtle hatchery nests to be 1.5°C higher than the natural nests (Jino et al. 2018). Although the nest temperatures currently recorded are not lethal for this species (Howard et al. 2014), there is concern that higher temperatures within the hatcheries could potentially feminise the population, creating environments that only produce females. Even without the hatcheries there is concern that natural sand temperatures could increase because of climate change and impact on survival and sex-ratios. More studies, like those undertaken by Jino et al. (2018) are needed to monitor sand temperatures within the nest chamber to gauge the effect of rising global temperatures on marine turtle embryo development in Solomon Islands.

Predation

From embryo to adult, marine turtles are preyed upon by a range of birds, reptiles, insects, crustaceans, fish and mammals, some of which are native species, while others are introduced predators (Heithaus 2013). It should be noted however, that marine turtles are a natural part of the food chain and for some native species, an important source of food; another reason for supporting recovery of marine turtle populations as they are part of the wider ecosystems.

In Solomon Islands Vaughan (1981) observed natural predators on nests, including iguanas[11] (although this appeared to be in only 3 out of the 112 nests surveyed), ghost crabs (*Ocypode* spp.), hermit crabs (*Coenobita* spp.) (digging into 19 per cent of nests on Kerehikapa Island) and rats. On hatchlings, Vaughan assumed birds, rats and crabs were all likely predators given track observations, and blacktip reef sharks were seen feeding on turtles near shore and a

[11] Pilcher (2021) suggests that these are Varanus spp.
[12] https://solomonislands-data.sprep.org/dataset/strandings-oceania-database

red snapper was caught with two hatchlings in its stomach. On adults, several individuals were observed with predator damage, such as missing flippers, from sharks or crocodiles. Mortimer (2002) also reports ghost crabs as a major threat to eggs and hatchlings, along with the purple swamphen (*Porphyrio porphyrio*), which in 2000, on Kerehikapa dug up nearly all nests; and Jino (et al. 2018) reports predation of eggs by dogs and pigs on Vangunu Island. Crabs are also reported to be the main predator on leatherback eggs on Tetepare Island with 24 nests partially or totally preyed upon in 2020–2021 (TDA unpublished data). Mackay (2005) reported that monitor lizards destroyed 50 to 60 per cent of nests on Tetepare Island, although recent data from TDA shows predation by monitor lizards (and dogs) to be very rare.

Other

Several other threats are known to negatively impact marine turtles in the Pacific, including light pollution, plastic pollution, ghost nets, unsustainable coastal development, FADs, boat strikes and fibropapilloma disease (Kennett et al. 1997, Wilson et al. 2004, Vuto et al. 2019, Work et al. 2020, NOAA 2021, Pilcher 2021). However, there appears to be no quantitative or qualitative reporting on the impact any of these threats are having on marine turtles within Solomon Islands. For example, the SPREP Strandings of Oceania Database[12] has no record of turtles or any listing for Solomon Islands. However, given the impact some of these threats can have, it is important that the 5-year National Plan of Action – Marine Turtles 2022–2026 starts to quantify their potential impact. Ghost nets, for example, are estimated to trap between 4,866 to 14,600 turtles per year along Australia's northern coast (Wilcox et al. 2014). Modelling of derelict fishing gear areas in Solomon Islands shows high probability of discarded nets and lines close to the Arnavons (Giskes 2019) and therefore, a potential threat to nesting hawksbills.

A diver observes a foraging green turtle © Kenneth Kassem

[12] https://solomonislands-data.sprep.org/dataset/strandings-oceania-database

Research and management initiatives

Hatchling leatherback turtles: Björn Svensson © WCS

Arnavons

The earliest reports of marine turtle research and management in Solomon Islands comes from McElroy and Alexander's work between 1973 and 1974 in the Arnavons. They observed the species' presence in the country, the main rookeries, nesting behaviour, population estimates and take by fishers (McElroy and Alexander 1979)[13]. In 1975–1977, Andrew McKeown began further work in the Arnavons, including stock assessments, nesting behaviour, distribution and trade of turtle shell (McKeown 1977). This was followed by similar work by Vaughan (1981) that led to the creation of the Arnavon Marine Conservation Area (AMCA) wildlife sanctuary. However, the approach to management was considered heavy handed, failing to involve the Arnavon traditional owners, resulting in infrastructure being burned down in 1982, ending the marine turtle project (Hamilton et al. 2015).

Between 1989 and 1990 the then Department of Environment and Conservation and the Fisheries Department looked to restart the programme, revisiting nesting grounds (Wilson et al. 2004). In 1991, TNC worked with local communities and the provincial governments of Choiseul and Isabel to re-establish the Arnavons sanctuary in addition to undertaking tagging and beach surveys of hawksbills in the same year (Hamilton et al. 2015). With a stronger emphasis on community involvement, the name was changed to the Arnavon Community Marine Conservation Area (ACMCA) in 1995 (Hamilton et al. 2015). In 2015, the original 1994–2002 management plan for the conservation area was updated and included marine turtle monitoring, protection and research (The Arnavon Marine Park 2015). Supported by TNC, research has included analysis of almost 20 years of data in the Arnavons on nesting hawksbills (Hamilton et al. 2015), and satellite tracking of hawksbills to understand migration routes, which has found that the Park is large enough to protect the females during the nesting season (Hamilton et al. 2021).

In 2017, the area was established as Solomon Islands' first National Park and renamed the Arnavon Community Marine Park (ACMP). The work in ACMP is also supported by the KAWAKI women's group that was set up in 2015 which helps to raise awareness on the park while also being activity involved in marine turtle conservation (Boso et al. 2018, James 2021). In

[13] Only the abstract of their work could be found for this literature review.

addition, in 2017 TNC supported the construction of a Ranger Station at Sikopo Island to improve the protection of nesting turtles (Hamilton et al. 2021).

Isabel Island

Work on marine turtles also started on Isabel Island, the main island to the east of the Arnavons, in the 1970s, including by McKeown (1977), who surveyed nesting beaches and then later by Vaughan (1981), who identified 38 nesting sites. Specific work on leatherbacks, which the island is known for, started in 1989 by Tanya Leary, who brought together stakeholders to start monitoring leatherbacks (Pita and Broderick 2005). Two of the most important beaches are Sasakolo and Litogarhira beaches where tagging has taken place since 1989 (NMFS and USFWS 2020), which has included support from TNC since 1992 (Kaukaui 2021). There are currently four active sites that TNC, funded through the National Oceanic and Atmospheric Administration (NOAA) support: Sasakolo, Litoghahira, Haevo and Sosoilo. Work has included tagging and satellite tracking (Kaukaui 2021). More recently, through NOAA, they have standardised their field data sheets, developed a master database and undertaken training to continue tagging, nest monitoring and Passive Integrated Transponder (PIT) tagging (NOAA 2020).

Tetepare/Rendova

In 2002, the Tetepare Descendants Association (TDA) was formed, originally to stop illegal logging on the island, but has since expanded to marine conservation activities, including protection of nesting leatherback turtles (UNDP 2013). This work expanded to the nearby Island of Rendova, where Mbaniata and Havila communities also took an interest in turtle conservation. The work on leatherbacks began with support from World Wide Fund for Nature (WWF) and involved surveying nesting behaviour, along with discussions with communities on reducing egg collection and using tourism as an alternative income to egg harvest (Wilson et al. 2004). Since that time, TDA Rangers have worked in shifts to protect nests of leatherback and green turtles at night during the peak season, tagging turtles and relocating nests to higher ground or installing predator exclusion devices (UNDP 2013, Masakolo et al. 2022). TDA also runs a turtle conservation incentive programme on Rendova where turtle monitors are financially rewarded for protecting nests (UNDP 2013, Masakolo et al. 2022). Rangers on Tetepare have also undertaken 'rodeo surveys' of foraging green turtles in the waters surrounding the islands, tagging and measuring individuals (Argument et al. 2009). The work on Tetepare and Rendova has also been supported by the local NGO, Solomon Islands Community Conservation Partnership (SICCP), which has provided mentoring and coaching for TDA management. WCS has provided support since 2019 and in 2019–2021, supported the construction of two shelters on Tetepare and one shelter and two huts on Rendova for Rangers to use for turtle monitoring and protection. In addition, WCS supported the construction of two turtle hatcheries on Tetepare and three on Rendova.

Vangunu

Jino et al. (2018) describes that in the 1990s, community members from Zaira Village on Vangunu Island noticed that the number of nesting leatherbacks seen each year was decreasing and so in 1999, placed a full ban on harvesting the species. Between 1999 and 2010, villagers observed little reward for the closure; only several nests were laid and none produced any living hatchlings. A hatchery programme was therefore established in 2011 to increase the hatching success. While from 2011 to 2014 only 11 leatherbacks nested, totalling 23 nests, hatching success had improved to 66.8 per cent. With the support from the University of Queensland and SICCP, villagers also undertook PIT tagging, temperature surveys of nests as well as satellite tracking of three female leatherbacks. Since 2019, WCS has been providing support to the Community Rangers at Zaira to monitor the leatherbacks, which has included upgrading their Ranger shelter and repairing the turtle hatchery.

Wai Hau

On Malaita Island in West Are' Are, the local community-based organisation (CBO), Wai Hau Conservation Foundation, was established in 2010 to protect leatherback turtles from poaching, beach erosion and crocodile predation (Boso et al. 2018). The Marine Research Foundation (MRF) trained Rangers in collecting data on turtles, including PIT tagging, tissue sampling for DNA analysis, and relocating eggs that may be threatened. Along with nesting leatherbacks, the

Rangers have also protected nests of olive ridley turtles and observed their hatchlings entering the ocean (Namo 2018). In addition to MRF, support to the foundation has also come from the IUCN Critical Environment Partnership Fund (Marine Research Foundation 2015, Namo 2018) and more recently through the Global Environment Facility (GEF) Small Grants Programme[14].

Mbota Community

On the south-eastern tip of Guadalcanal is the Mbota Community Leatherback (Raro) Turtle Conservation area. Conservation of leatherbacks in the area was first implemented by the Visunaoru community in 2016, and they have since been joined by Chukunaleilei, Chaunamate and Kololauvi communities (Aram et al. 2021). The communities have developed a management plan for the area, which includes penalties for turtle harvesting. Members of the communities have undergone training in turtle conservation and monitoring, and the communities have received village and school level awareness on the significance of marine species, as well as on marine turtle conservation. The Mbota Community is currently receiving support from MFMR, the Coral Triangle Initiative (CTI) and Conservation International.

Other Sites and Research

Several other sites have had or currently have some level of turtle monitoring and/or research since the 1970s, including on Choiseul, Makira (San Cristobel), Shortland, Russel, Santa Cruz and Kolombangara Islands, including tagging and nest monitoring (McKeown 1977, Vaughan 1981, Wilson 2004, Esbach et al. 2014).

TREDS

Turtle Research and Monitoring Database System (TREDS)[15] is the platform established by SPREP for Pacific Island countries and territories to manage their turtle data. Data from Solomon Islands was entered in the database up until 2009. This included 822 turtle records in the database for Solomon Islands, which included 426 for greens, 256 for hawksbills, 132 for leatherbacks, 3 loggerheads and 3 olive ridleys (Trevor 2009). The database has a record of the tag series distributed by SPREP and other agencies. TREDS has now been upgraded to a web-based platform with additional offline data entry options and other features. Training in its use is available to all Pacific Island countries and territories. Given how widely marine turtles can migrate, having data for the region stored centrally may be useful to coordinate conservation planning and potentially should be adopted as the platform for all Solomon Islands marine turtle data.

[14] https://sgp.undp.org/spacial-itemid-projects-landing-page/spacial-itemid-project-search-results/spacial-itemid-project-detailpage.html?view=projectdetailandid=23803

[15] https://www.sprep.org/thetreds

Knowledge gaps and recommendations

The following priority knowledge gaps have been identified during the collation of this literature review and include recommended actions:

1. Population trends based on both nesting and in-water monitoring:

1.1 While several sites have current nesting data, a number have not been surveyed for over 30 years. Action: Identification of the most productive nesting beaches and work towards long-term monitoring and nest protection at these sites (ideally through community led monitoring programmes).

1.2 Very few sites have data on in-water populations, therefore missing information on juveniles and males[16]. Action: Identification of key foraging sites and undertake annual in-water surveys (although logistically difficult for leatherbacks).

2. Post nesting migration routes and foraging grounds:

2.1 As Hamilton et al. (2021) papers highlight, the use of satellite tracking can be invaluable to identify migration routes and foraging grounds that can be targeted for conservation (and also to help identify overlaps with fishing grounds). Currently, information is limited to Arnavons and Zaira (Vangunu Island). Action: Undertake satellite tagging of leatherbacks and greens to identify their migration routes and foraging grounds.

3. Threats

3.1 There is no quantified data on the size of the SSF fleet or related by-catch in Solomon Islands. Action: Undertake initial surveys through questionnaires in communities to gauge number of boats, gear types and level of interaction with marine turtles.

3.2 Quantified information on the impacts of climate change is limited; for example, data on sand temperatures at nesting beaches or data on beach erosion and flooding events. Action: Record sand temperature readings of natural sand, in situ nest chambers and nest chambers in hatcheries. Monitor beach erosion and tidal incursion at key nesting beaches.

3.3 Quantified information on the impact of predation on nests is limited. Action: Undertake surveys of predation levels and species on key nesting beaches, tied with hatching success records.

4. Legislative impact on subsistence or culture of local communities

4.1 If subsistence harvest by local communities of marine turtles was banned, what impact would this have on food security? Action: Undertake surveys through questionnaires in communities to gauge economic and cultural impact bans subsistence harvest may cause.

5. Coordination/centralisation of data

5.1 The only centralised database previously used in Solomon Islands was TREDS, which completed a upgrade in 2022 (through BIEM funding). Without a centralised system, understanding population trends requires sifting through multiple databases or reports. Action: Solomon Islands turtle working committee work towards a central database.

[16] Understanding changes in populations of juveniles and sub-adults is important in assessing future marine turtle populations (Chaloupka 1997).

Photo: Björn Svensson © WCS

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