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Turtle Research and Monitoring Database System (TREDS) Annual Report 2009

By Anne Patricia Trevor
3 December 2009



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1 Background of TREDIS

1.1 Introduction

The Turtle Research and Monitoring Database System (TREDIS) has been developed as a database system for turtle research and monitoring conducted by Pacific Island Countries and Territories (PICTs) that are members of the Secretariat of the Pacific Regional Environment Programme (SPREP). It is a tool that can be used to bring together and manage data from various government agencies, Non-government Organisations (NGOs) and community groups who undertake turtle research, monitoring and tagging in the Pacific region.

More specifically, TREDIS can be used at the country level to collate and perform simple analysis on data collected from turtle surveys and generate reports to assist in informed decision-making for turtle conservation and management. At the regional level, TREDIS can be used to collate data, provide backup services to SPREP members and identify trends in turtle populations and migration patterns in the Pacific region.

In the SPREP region, TREDIS is currently used in American Samoa, Commonwealth of the Northern Marianas Islands, Fiji, French Polynesia, Federated States of Micronesia – Yap, Guam, Kiribati, Marshall Islands, New Caledonia, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. TREDIS currently holds 10,906 turtle encounter records for all species of turtle in the Pacific Region.

Although TREDIS was developed for PICTs, it can be used readily by anyone involved in marine turtle research anywhere in the world. TREDIS is available for download at <http://www.sprep.org/treds/TREDSnews.aspx>.

1.2 History of TREDIS

The SPREP Regional Marine Turtle Conservation Programme started in 1990 with financial support from the Canadian Government. The main objective of this programme was to establish a regional marine turtle database for PICTs conducting turtle conservation activities.

In 1993, a regional database was established using expertise from the Queensland Department of Environment and Heritage in Australia. This regional database was officially transferred to SPREP in 1994, and the current system is largely based on this previous initiative, but now using Microsoft® ACCESS as its operating platform.

In the 2003-2007 Marine Turtle Action Plan (MTAP), PICT members tasked the SPREP secretariat to coordinate the upgrade and update of the regional marine turtle database and assist members with database operational services. Furthermore, Theme 8 of the current 2008-2012 MTAP identifies various actions to be carried out by both the SPREP members and the secretariat to ensure wide implementation of TREDIS in the region.

From 2003 to date, the development and implementation of TREDs has been financially supported by the Western Pacific Regional Fishery Management Council (WPRFMC). Other partners have included the South-East Asia Fisheries Development Centre (SEAFDEC), the Secretariat of the Pacific Community (SPC), the Queensland Department of Environment and Resource Management, the US National Oceanic and Atmospheric Administration (NOAA) - National Marine Fisheries Service (NMFS), and the Marine Research Foundation.

TREDs was officially launched on the 17th February 2009 at the 29th Annual Symposium on Sea Turtle Biology and Conservation in Brisbane, Australia.

A TREDs User Manual is available from the SPREP website at <http://www.sprep.org/treds/TREDsnews.aspx>.

1.3 Regional Turtle Research and Monitoring Database System (TREDs) Data Sharing and Exchange Policy (DSEP)

Action 8.1 of the 2008-2011 MTAP identifies the need for a TREDs Data Sharing and Exchange Policy and Protocol to ensure its effective operations and management. The TREDs DSEP was endorsed at the 20th SPREP meeting on the 18th November 2009.

The purpose of the policy is to provide a framework for accessing, exchanging and sharing of data between SPREP, its member PICTs and any other relevant parties that are involved in turtle conservation activities.

The policy further includes a data schedule/exchange between SPREP and its member PICTs.

1.4 TREDs Annual Report

This report provides an overview of nesting, foraging and migration of marine turtles in the SPREP Pacific Islands regions based on data held in TREDs at the SPREP Secretariat. The compilation of this report further fulfils requirements under theme 8 of the 2008 – 2012 SPREP Regional Marine Turtle Action Plan.

2 Tag Inventory

The tag inventory records all details of tags received from SPREP or other organisations as well as details of tags distributed lost or damaged. The tag inventory can be used to record all the various types of tags (e.g. passive integrated transponder (PIT) tags, flipper tags, and satellite tags) and data loggers. Of the 42,335 flipper tags distributed by the secretariat to SPREP member PICTs, 11,219 (26.5%) have been recorded in TREDS (table 1). Tags received from other agencies such as the US Fish and Wildlife Service and the Queensland Park and Wildlife Service are also recorded in TREDS if they are reported to SPREP. There are currently 2,649 of these other tags recorded in TREDS (table 1), giving a combined total of 14,168 tags recorded in TREDS.

Table 1: flipper tags distributed by SPREP

Country/Territory	No. of flipper tags distributed by SPREP	No. of tags recorded in TREDS	No. of other tags recorded in TREDS
American Samoa	479	26	171
Commonwealth of the Northern Marianas Islands	600	101	0
Cook Islands	600	18	0
Federated States of Micronesia	6,650	2,596	191
Fiji	1811	78	387
French Polynesia	2,873	1,050	1,144
Guam	200	12	33
Kiribati	200	24	0
New Caledonia	7,292	2,801	227
New Zealand	150	0	0
Palau	1,620	521	6
Papua New Guinea	3,426	55	394
Republic of the Marshall Islands	1,220	212	2
Samoa	1,306	246	0
Solomon Islands	3,045	1,016	93
Tonga	450	11	1
Tuvalu	750	60	0
Vanuatu	9,663	2,392	0
Total	42,335	11,219	2,649

3 Size Frequency by Species

3.1 Green turtle Size Frequency

A total of 5466 green turtle records in TREDIS have CCL measurements. The size frequency graph for green turtles recorded in TREDIS for SRPEP region (figure 1) shows 3476 adult sized turtles with CCL ranging between 85.0 – 139.9cm, followed by juveniles within the 40.0 – 54.9cm CCL range (n = 1286) and sub-adult sized turtle with CCL ranging between 55.0 – 84.9cm (n = 199). The majority of turtles recorded in TREDIS with CCL measurements are adults encountered through nesting surveys conducted around the Pacific Islands region.

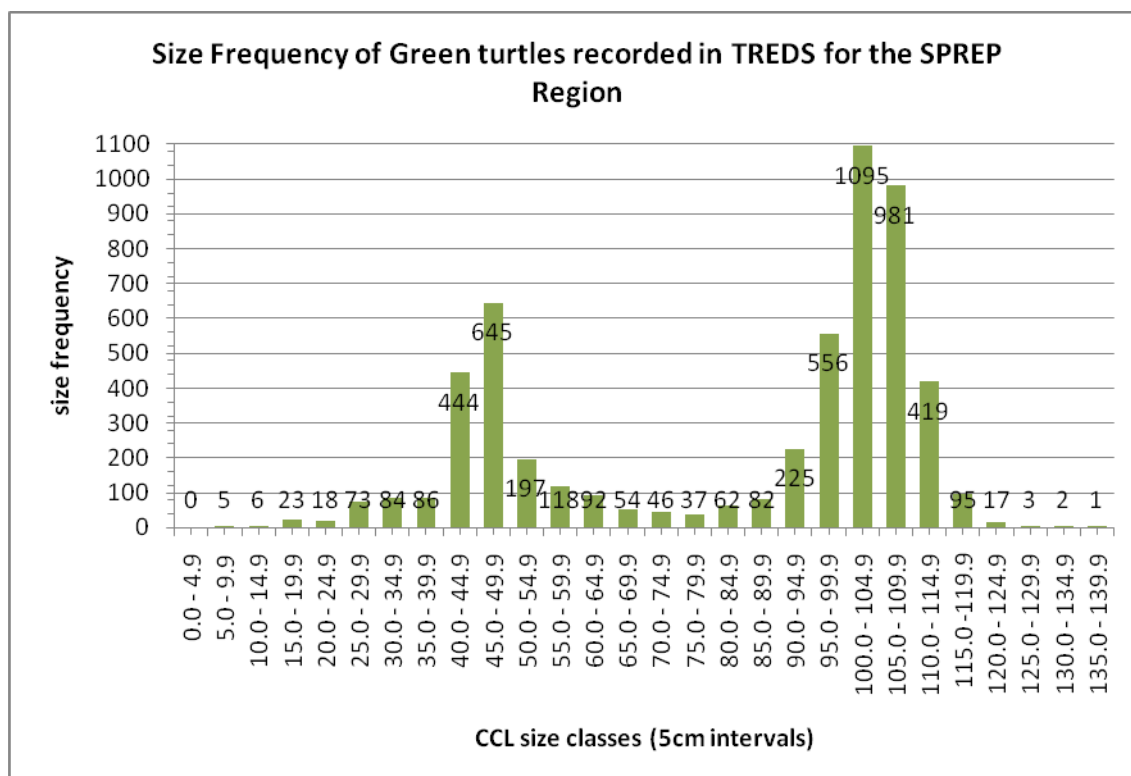


Figure 1: Green turtle size frequency

3.2 Hawksbill turtle Size Frequency

A total of 1464 hawksbill turtle records in TREDIS have CCL measurements. The size frequency graph for hawksbill turtles recorded in TREDIS for the SPREP region (figure 2) shows three peaks: small juveniles ranging between 10.0 – 19.9 cm CCL (n = 307); medium-sized juveniles ranging between 30.0 – 45.0 cm CCL (n = 644), and adults ranging between 80.0 – 94.9 cm (n = 245). Of these size distribution peaks, the small juveniles (10.0 – 19.9 cm CCL) correspond to hatchlings that have been captive reared, tagged, and released from Treasure Island Resort in Fiji.

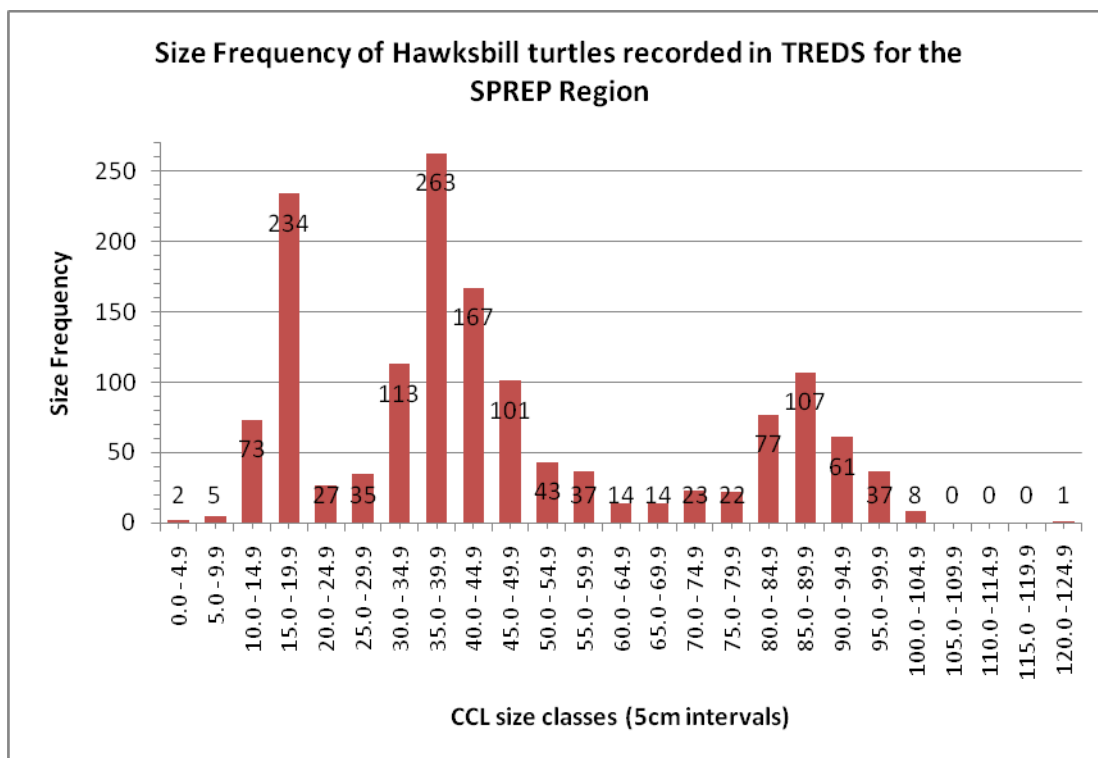


Figure 2: Hawksbill turtle size frequency

3.3 Leatherback turtle size frequency

A total of 211 leatherback turtle records in TREDs have CCL measurements, all of which are from nesting surveys. The size frequency graph for leatherback turtles recorded in TREDs for the SPREP region (figure 3) shows that most records are those of adults with CCL ranging between 150.0 – 174.9cm (n = 188).

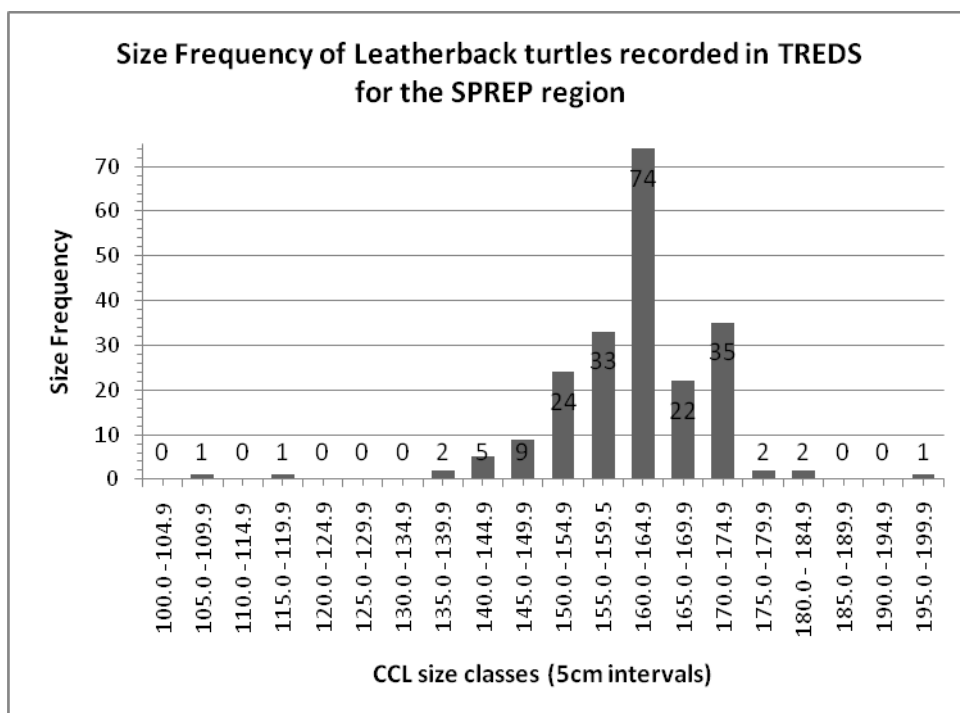


Figure 3: Leatherback turtle Size Frequency

3.4 Olive Ridley turtle size frequency

Seven olive ridley turtle records in TREDs have CCL measurements. The size frequency graph for olive ridley turtles recorded in TREDs for the SPREP (figure 4) shows six juvenile turtles within the 45.0 – 54.9cm CCL size class range and one adult sized turtle within the 65.0 – 69.9cm CCL size class range.

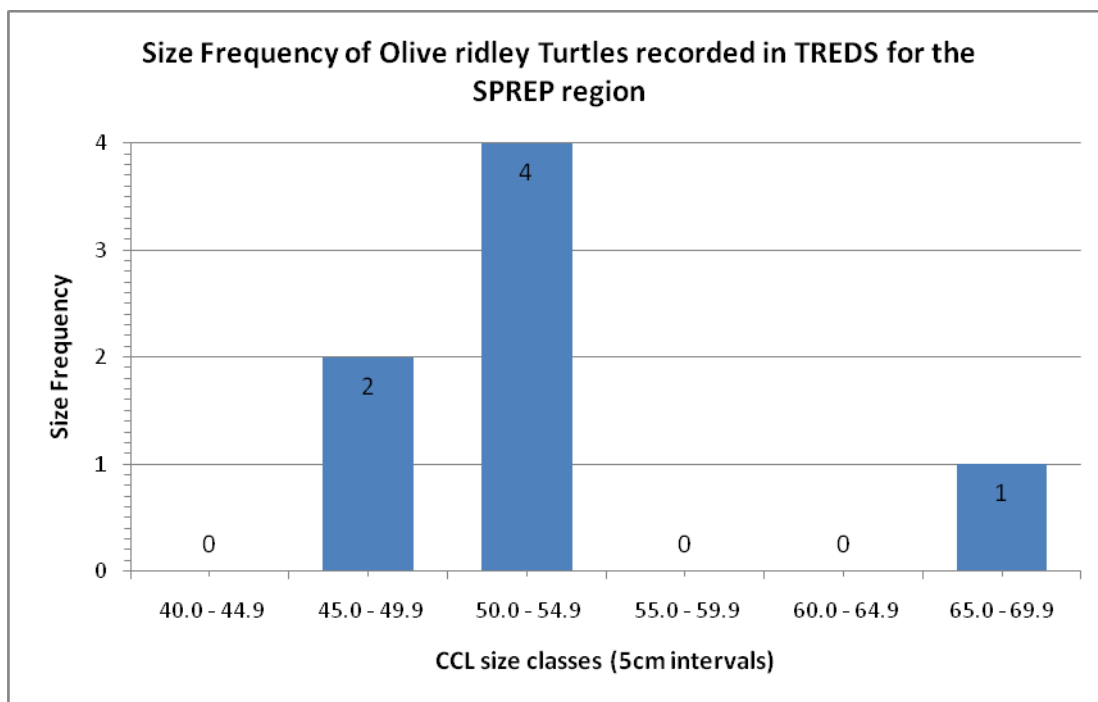


Figure 4: Olive Ridley turtle size frequency

3.5 Loggerhead turtle size frequency

TREDs holds no loggerhead turtle record with CCL measurements.

4 Nesting

Monitoring of nesting turtles in the Pacific Islands region involves various parties, that include individual researchers, environment and fisheries government agencies, international NGOs such as World Wide Fund for Nature (WWF), Conservation International (CI), and The Nature Conservancy (TNC); and local NGOs such as Wan Smolbag's Vanua Tai Monitors, the Association Pour la Sauvegarde de la Nature Neo-Calédonienne, and Fondation Hibiscus.

Numbers of tag information also varies due to the variance of survey intensity and frequency. In areas with low numbers of tagging data, more targeted and continuous surveys need to be carried out to confirm turtle populations and their associated activities.

4.1 Green turtle nesting

A total of 4,664 nesting green turtles (*Chelonia mydas*) are recorded in TREDIS for the SPREP region (table 2). It is important to note that numbers recorded are cumulative with varying years as most survey efforts in the SPREP region have not been carried out continuously over a long period of time to the extent conducted by the Queensland Turtle Research Project. The numbers recorded for these sites are likely a reflection of the varying levels of survey effort in these areas, and may not represent actual levels of nesting across the region. Green turtle nesting areas identified in TREDIS with more than 50 nesting records are:

- Scilly and Bellinghausen Atoll in French Polynesia (n = 482),
- Huon, Fabre, Surprise and Le Leizour Islands of the D'Entrecasteaux Reef system in New Caledonia (n = 1875),
- Ulithi and Ngulu Atolls in Yap, Federated States of Micronesia(n = 1484),
- Long Island in Papua New Guinea(n = 179),
- Bikar and Erikub Atolls and Jemo Island in the Ratak chain of the Marshall Islands (n = 62), and
- Bamboo Bay, Malekula in Vanuatu (n = 52).

Table 2: Cumulative Green turtle nesting

COUNTRY	LOCATION	NUMBER
American Samoa	Rose Atoll	48
Cook Islands	Cooks Islet	8
Federated States of Micronesia	Ulithi Atoll	1,414
Federated States of Micronesia	Ngulu Atoll	70
Federated States of Micronesia	Oroluk Atoll	21
Federated States of Micronesia	Olimarao Atoll	12
Federated States of Micronesia	Elato Atoll	7
Federated States of Micronesia	Sawatal Island	1
Federated States of Micronesia	Woleai Atoll	1

Fiji	Lau Group	1
French Polynesia	Scilly Atoll	449
French Polynesia	Bellinghausen Atoll	33
Kiribati	Noto Islet	1
Marshall Islands	Ratak Chain	62
New Caledonia	Huon Island	1,194
New Caledonia	Le Leizour Island	310
New Caledonia	Fabre Island	251
New Caledonia	Surprise Island	120
New Caledonia	Roche Percee	9
Northern Marianas	Saipan	7
Palau	Helen Island	188
Palau	Merir Island	124
Palau	Tobi Island	47
Papua New Guinea	Long Island	179
Solomon Islands	Isabel Province	7
Solomon Islands	Tetepare Island	5
Solomon Islands	Obeani Island	1
Vanuatu	Votlo	11
Vanuatu	Bamboo Bay, Malekula	52
Vanuatu	Malekula	21
Vanuatu	Vaipei, Espiritu Santo	2
Vanuatu	Tasiriki, Moso	2
Vanuatu	Epi Island	1
Vanuatu	Espiritu Santo	2
Vanuatu	Motalava Island	1
Vanuatu	Asaola, Pentecost	1
Vanuatu	Litatra, Tegua	1
Total		4,664

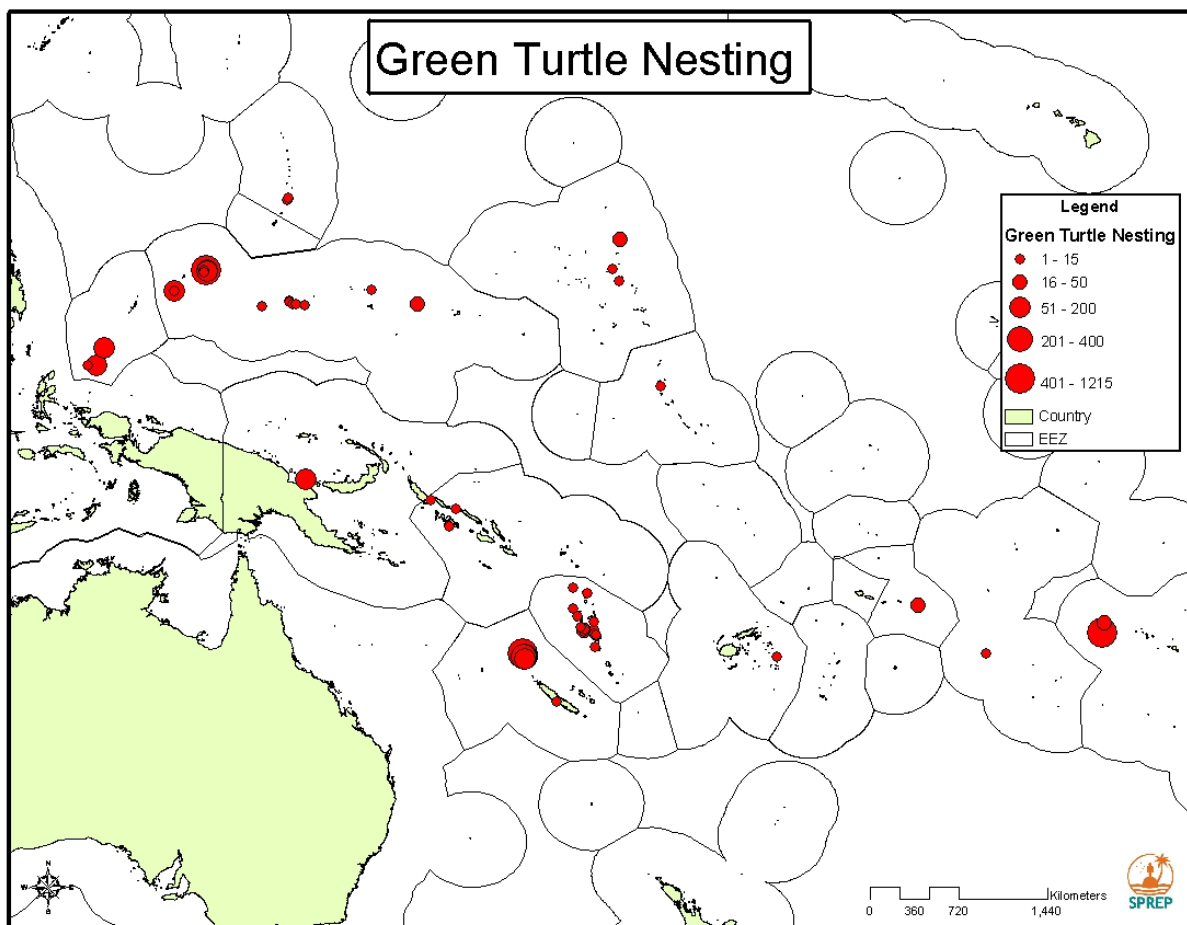


Figure 5: Cumulative Green turtle nesting recorded in TREDIS for the SPREP region

4.2 Hawksbill turtle nesting

A total of 331 Hawksbill turtle, (*Eretmochelys imbricata*) have been recorded in TREDIS as nesting in the SPREP region and are summarised below in Table 3 and Figure 6. Some of the hawksbill turtle nesting sites identified by TREDIS for the Pacific region include;

- Siumu, Aleipata and adjacent islands in Samoa (n = 34),
- the Arnavons Islands in the Isabel Province of Solomon Islands (n = 149),
- the Obeani Islands in the Western Province of the Solomon Islands (n = 18) ,
- Bamboo Bay on Malekula Island in the Malampa Province of Vanuatu (n = 54),
- And Moso Island in the Shefa Province of Vanuatu (n = 46).

The areas above have been identified as hawksbill nesting areas through surveys that have been conducted in these areas. The Solomon Islands may be the most consistent in numbers as surveys continue to be conducted on the annual basis by government, TNC and WWF other partners in the Solomon Islands. Not all of this information is held in TREDIS but SPREP is liaising with government and NGO partners to include all these data in TREDIS. Further surveying is needed in American Samoa, Fiji, Guam, Palau, Papua New Guinea, Samoa and Vanuatu to confirm nesting numbers and potentially important sites for conservation.

Table 3: cumulative Hawksbill turtle nesting

<i>Country/territory</i>	<i>Location</i>	<i>Number</i>
American Samoa	Tutuila	6
Fiji	Namenalala Island	2
Fiji	Caqelai Island	1
Fiji	Yadua Tabu Island	1
Guam	Guam Island	3
Palau	Malakal Island	2
Papua New Guinea	Wide Bay	1
Papua New Guinea	Suau Island	1
Samoa	Aleipata and adjacent islands	34
Samoa	Saaga Beach, Siumu	1
Solomon Islands	Arnavons Islands	149
Solomon Islands	Obeani Islands	18
Solomon Islands	Choiseul Island	1
Solomon Islands	Kia Island	1
Solomon Islands	Nelua Island	1
Solomon Islands	Wagina Island	1
Vanuatu	Bamboo Bay, Malekula	54
Vanuatu	Malekula Island	4
Vanuatu	Efate Island	1
Vanuatu	Epi Island	2
Vanuatu	Moso Island	46
Vanuatu	Tavloel	1
Vanuatu	Espiritu Santo Island	2
Vanuatu	Wiawi, Malekula	3
Total		331

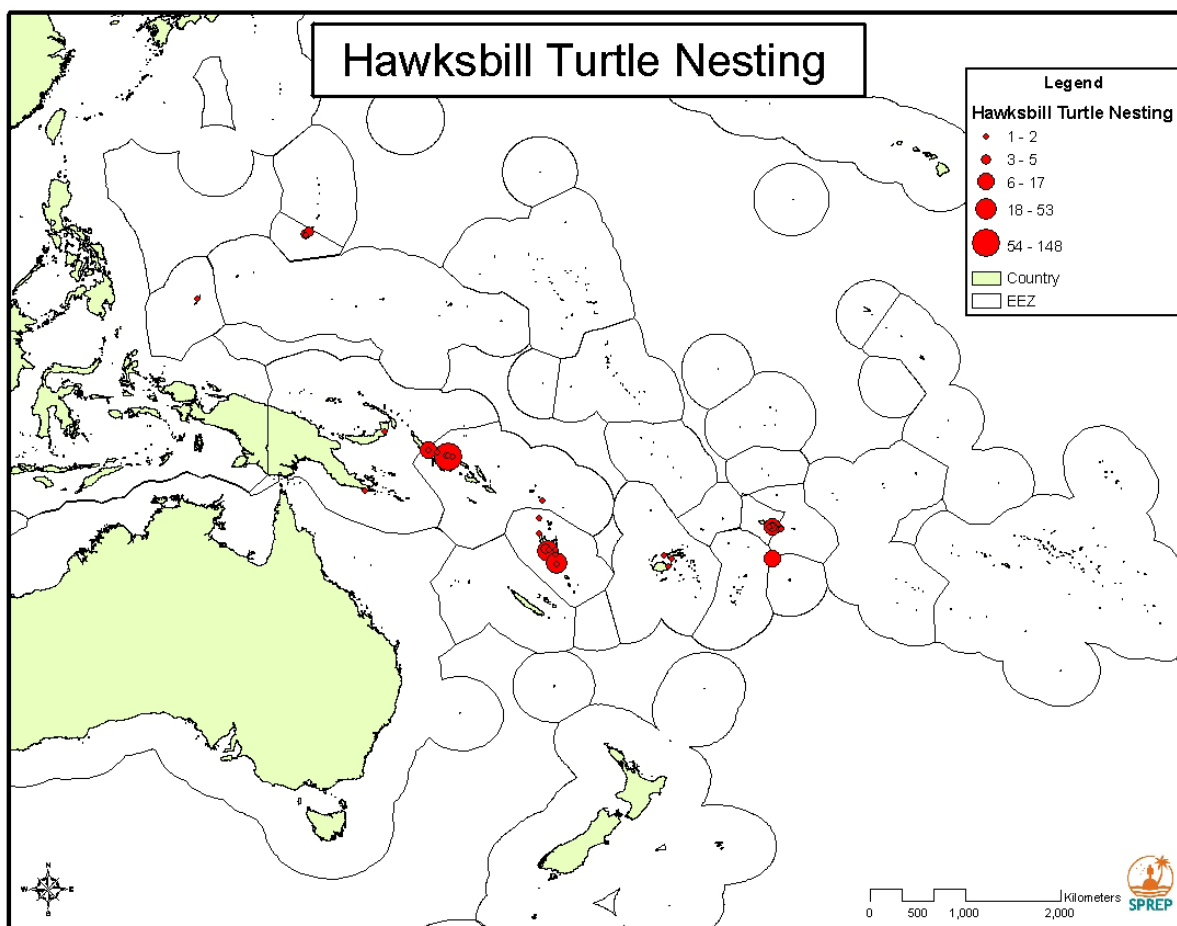


Figure 6: Hawksbill turtle nesting in the SPREP region

4.3 Leatherback Turtle Nesting

There are currently 175 leatherback turtle (*Dermochelys coriacea*) nesting recorded in TREDs for the SPREP region are summarised below in table 4 and figure 7. Leatherback turtle nesting has been reported from the following areas:

- Huon Coast in the Morobe Province of Papua New Guinea (n = 75),
- Sasakolo Beach and Lilika Bay in the Isabel Province of the Solomon Islands (n = 69),
- Tetepare and Rendova Islands in the Western Province of the Solomon Islands (n = 21),
- Wainoni Bay of the Makira-Ulava Province of the Solomon Islands (n = 1),
- Votlo and Port Qumie, Epi Island in the Shefa Province of Vanuatu (n = 8),
- And Port Olry, Espiritu Santo Island of the Sanma Province of Vanuatu (n = 1).

Table 4: Leatherback nesting numbers

Country	Province	Location	Numbers
Papua New Guinea	Morobe	Huon Coast	75
Solomon Islands	Isabel	Lilika Bay	10
Solomon Islands	Isabel	Sasakolo Beach	59
Solomon Islands	Western	Tetepare Island	20
Solomon Islands	Makira-Ulava	Wainoni Bay	1

Solomon Islands	Western	Rendova island	1
Vanuatu	Shefa	Votlo, Epi Island	7
Vanuatu	Shefa	Port Qumie, Epi Island	1
Vanuatu	Sanma	Port Olry, Espiritu Santo	1
Total			175

Additional leatherback data of surveys in the Morobe Province of Papua New Guinea has been forwarded recently to SPREP and this data will be imported into the master TREDs at SPREP in early 2010.

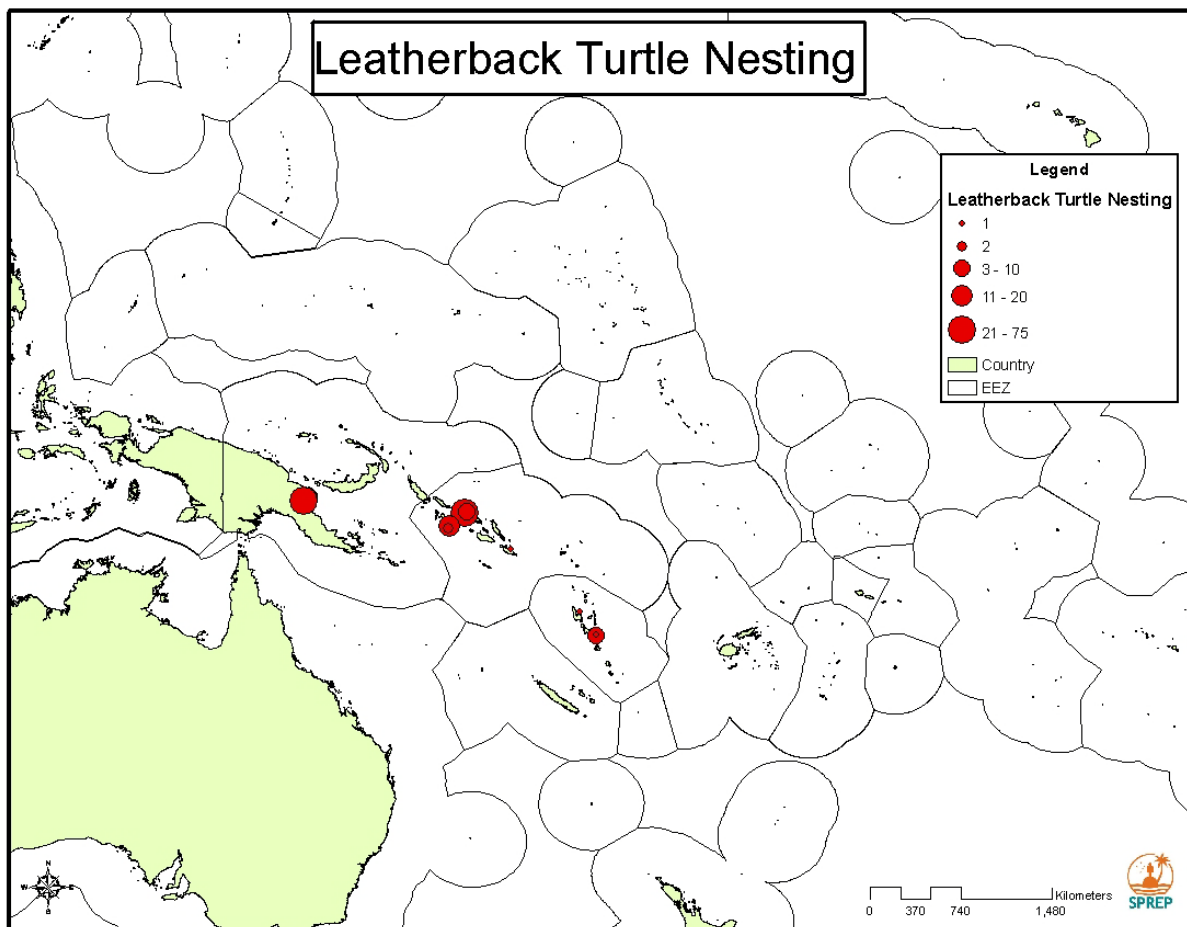


Figure 7: leatherback turtle nesting in the SPREP region

4.4 Loggerhead turtle nesting

There are only three incidences of loggerhead turtle (*Caretta caretta*) nesting recorded in TREDs for the Pacific Islands, one at Loh Island, Torba Province of Vanuatu, and the other two at Honiara, Guadalcanal Island of the Solomon Islands.

Although loggerhead nesting is reported from various PICTs, this data has not yet been made available to SPREP for input into TREDs.

5 Foraging

Currently, there are very few targeted foraging surveys conducted in the Pacific. The Solomon Islands and Australia conducts regular foraging surveys while other PICTs only encounter foraging turtles on an *ad hoc* basis. Some in-water surveys have been conducted in CNMI and these data will be imported into TREDIS in early 2010.

5.1 Green turtle foraging

Information on green turtle foraging areas based on tag recoveries recorded in TREDIS exists for the following 16 of the 24 member PICTs of SPREP (figure 8):

- Australia (Queensland and the Torres Strait),
- Cook Islands,
- Federated States of Micronesia,
- Fiji Islands,
- French Polynesia,
- Kiribati,
- New Caledonia,
- Palau,
- Papua New Guinea,
- Republic of the Marshall Islands,
- Samoa,
- Solomon Islands,
- Tonga,
- Tuvalu,
- Vanuatu, and
- Wallis and Futuna

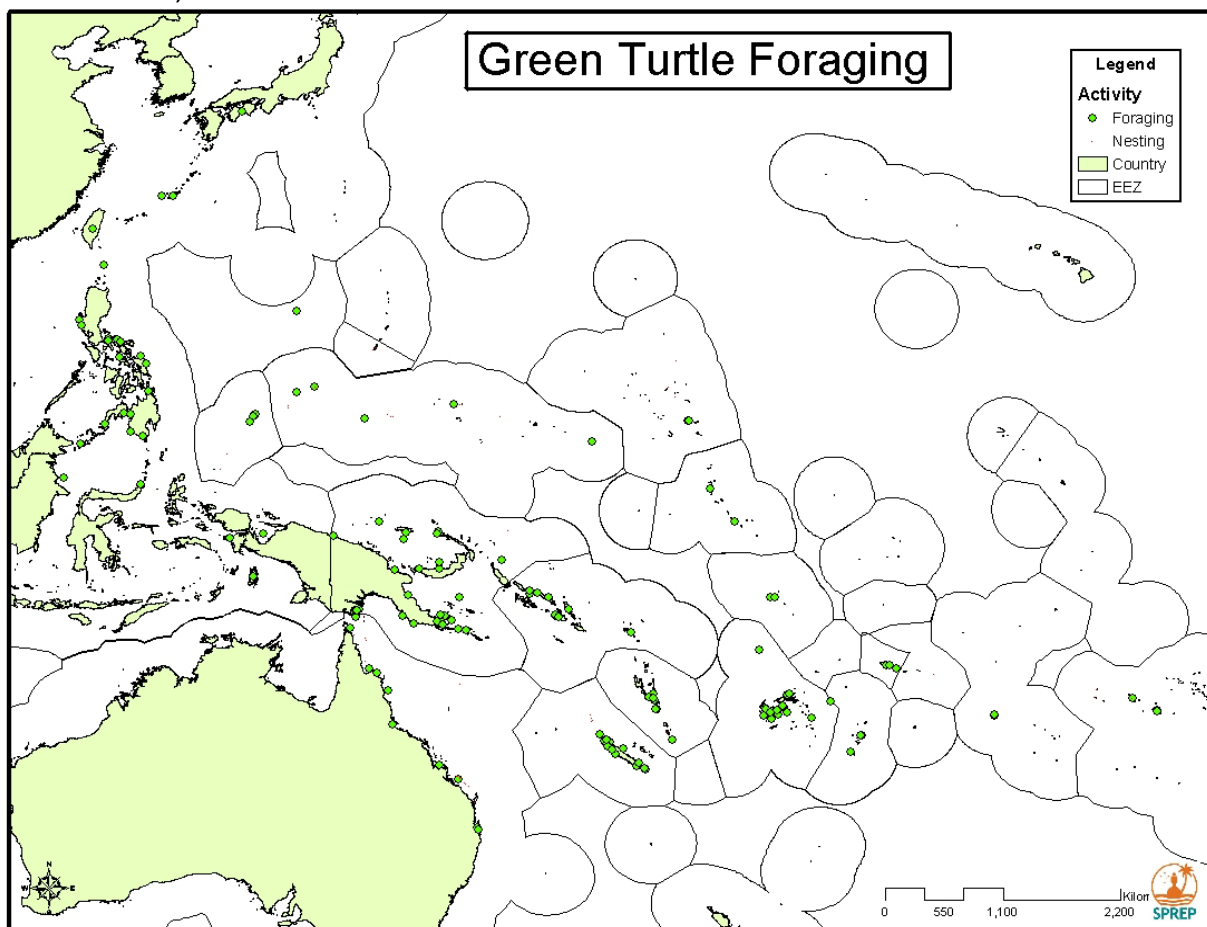


Figure 8: Green turtle foraging area

A cumulative total of 2606 green turtles are recorded in TREDIS as foraging turtles (table 5). Foraging green turtles in TREDIS were recorded in American Samoa (n = 19), CNMI (n = 141),

Cook Islands (n = 9), Fiji (n = 30), FSM (n = 30), French Polynesia (n = 983), Guam (n = 37), Kiribati (n = 16), Marshall Islands (n = 19), New Caledonia (n = 41), Palau (n = 65), PNG (n = 38), Samoa (n = 93), Solomon Islands (n = 415), Tonga (n = 7), Tuvalu (n = 33) and Vanuatu (n = 630). These numbers are likely a reflection of the varying levels of survey effort in these areas, and may not represent actual levels of foraging across the region. For example, the high numbers recorded in French Polynesia and Vanuatu are due to the annual tagging carried out by Fondation Hibiscus in French Polynesia and Wan Smolbag in Vanuatu, while the high numbers recorded in Solomon Islands and CNMI are due to targeted foraging surveys that were conducted in these areas.

Although targeted foraging surveys are needed in most of the PICTS, the high numbers of foraging green turtles recorded in TREDIS for CNMI, French Polynesia, Solomon Islands, and Vanuatu point towards these areas being potentially important foraging areas for green turtle in the Pacific Islands region

Table 5: Cumulative number of foraging green turtle

Country/Territory	Number of turtles
American Samoa	19
Commonwealth of the Northern Marianas Islands	141
Cook Islands	9
Fiji	30
Federated States of Micronesia	30
French Polynesia	983
Guam	37
Kiribati	16
Marshall Islands	19
New Caledonia	41
Palau	65
Papua New Guinea	38
Samoa	93
Solomon Islands	415
Tonga	7
Tuvalu	33
Vanuatu	630
<i>total</i>	<i>2606</i>

5.2 Hawksbill turtle foraging

Identified hawksbill foraging sites based on tag recoveries recorded in TREDIS for the SPREP region (figure 9) include:

- Australia
- Federated States of Micronesia
- Fiji
- Kiribati

- Papua New Guinea
- Samoa
- Solomon Islands
- Vanuatu

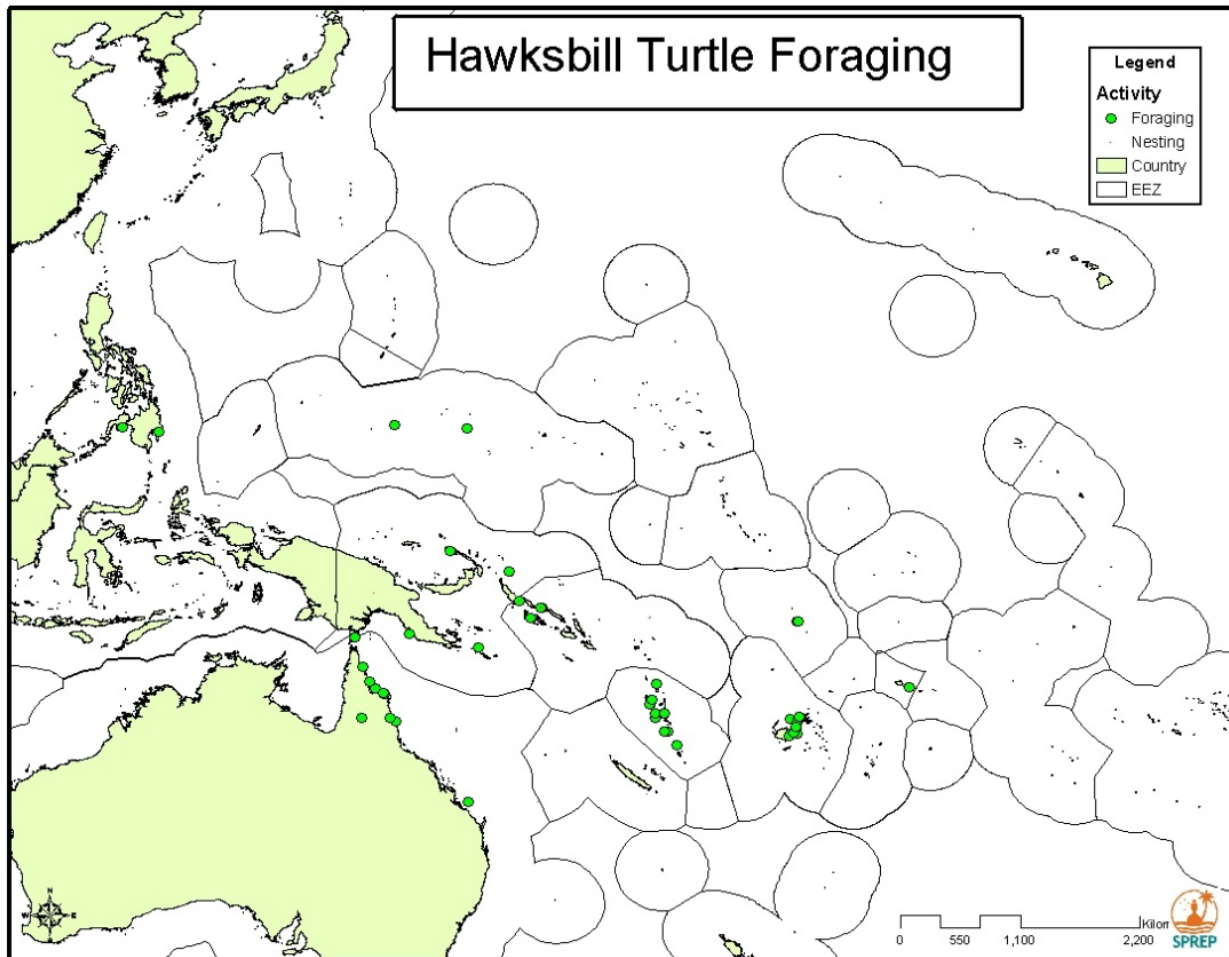


Figure 9: foraging sites for hawksbill turtles in the SPREP region

A cumulative total of 1301 hawksbill turtles are recorded in TREDs as foraging turtles (table 6). The most turtles were recorded in Vanuatu ($n = 549$) as the Wan Smolbag Vanua Tai monitors have tagged and released foraging turtles in their respective areas. Other foraging hawksbill turtles in TREDs were recorded in American Samoa ($n = 60$), CNMI ($n = 5$), Cook Islands ($n = 4$), Fiji ($n = 364$), FSM ($n = 13$), French Polynesia ($n = 57$), Guam ($n = 10$), Marshall Islands ($n = 4$), Palau ($n = 33$), PNG ($n = 7$), Samoa ($n = 62$), Solomon Islands ($n = 127$), Tonga ($n = 5$) and Tuvalu ($n = 1$). Again, the numbers recorded for these countries and territories are likely a reflection of the varying levels of survey effort in these areas as well as numbers recorded in TREDs for these areas. The high numbers in Fiji are a result of tag and release activities being carried out on Treasure Island Resort in Fiji.

While further foraging surveys are needed in most these areas these numbers show that Vanuatu, Fiji and Solomon Islands are potentially important hawksbill foraging sites in the SPREP.

Table 6: Cumulative number of foraging hawksbill turtles

Country/Territory	Number of turtles
American Samoa	60
Commonwealth of the Northern Marianas Islands	5
Cook Islands	4
Fiji	364
Federated States of Micronesia	13
French Polynesia	57
Guam	10
Marshall Islands	4
Palau	33
Papua New Guinea	7
Samoa	62
Solomon Islands	127
Tonga	5
Tuvalu	1
Vanuatu	549
Total	1301

5.3 Loggerhead turtle foraging

Foraging areas for loggerhead turtles in the Pacific Islands region recorded in TREDIS are the Milne Bay Province in Papua New Guinea and New Caledonia (figure 10). All six records are of post-nesting females initially tagged while nesting in Queensland, Australia by the Queensland Turtle Research Project. These records indicate that New Caledonia and Papua New Guinea could be important foraging areas for loggerhead turtles from Australia but more information is needed to confirm this.

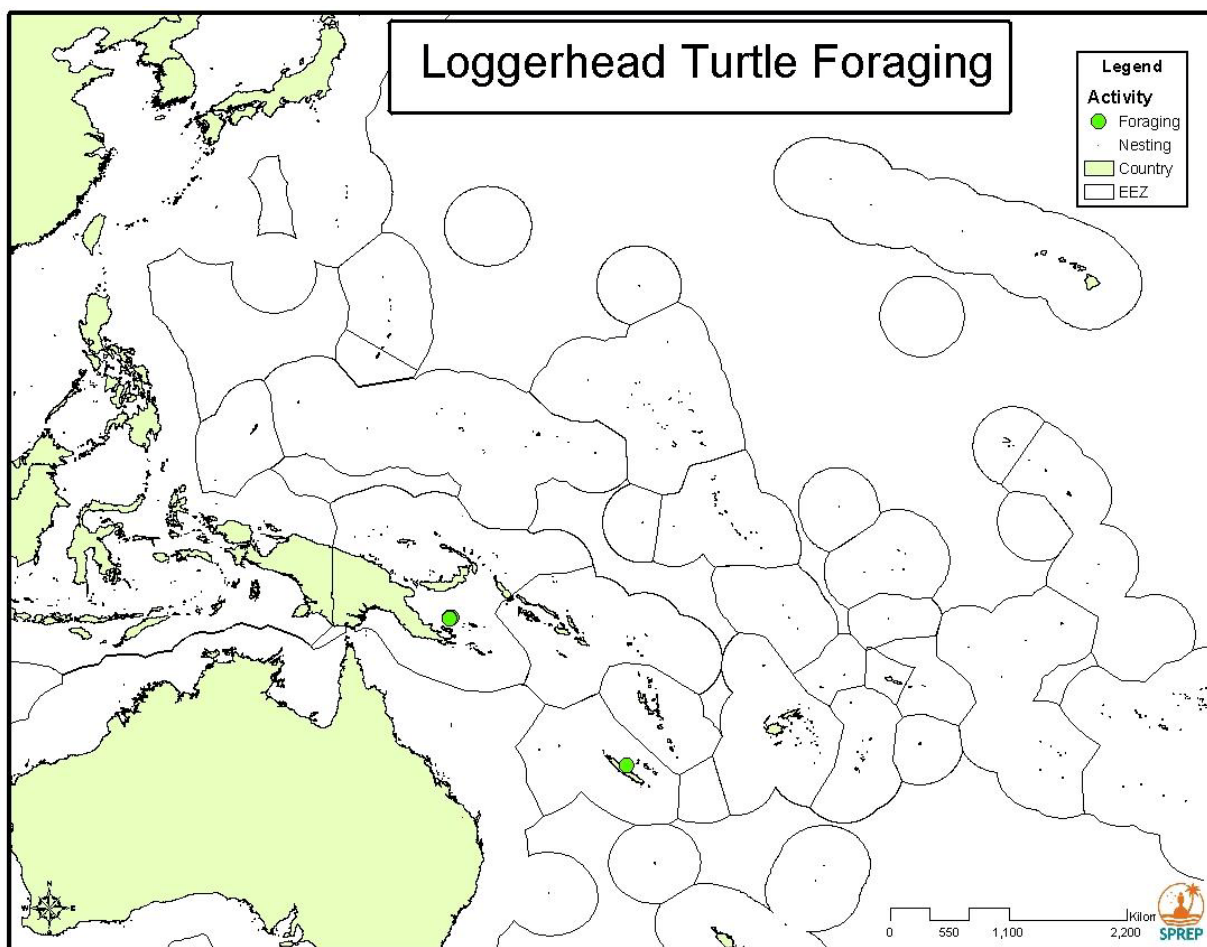


Figure 10: foraging sites for loggerhead turtles recorded in TREDs for the SPREP region

5.4 Olive Ridley turtle foraging

A total of four Olive ridley turtles were recorded as foraging in TREDs from American Samoa (n = 1), French Polynesia (n = 1) and Palau (n = 2).

5.5 Leatherback turtle foraging

Only three foraging leatherback turtles are recorded in TREDs. Two turtles were captured as during longline fishing trips in American Samoa and Samoa respectively while one was found dead on Ritidian Beach in Guam. These turtles were probably on route to a foraging area.

5.6 Unidentified Species

A total of 152 unidentified species of turtles are recorded in TREDs as foraging (table 7) American Samoa (n = 8), CNMI (n = 10), Cook Islands (n = 3), Fiji (n = 14), FSM (n = 9), French Polynesia (n = 96), New Caledonia (n = 4), PNG (n = 3) and Solomon Islands (n = 5).

Table 7: cumulative number of unidentified foraging turtles

Country/Territory	Number of turtles
American Samoa	8
Commonwealth of the Northern Marianas Islands	10

Cook Islands	3
Fiji	14
Federated States of Micronesia	9
French Polynesia	96
New Caledonia	4
Papua New Guinea	3
Solomon Islands	5
<i>total</i>	<i>152</i>

6 Migration

Marine turtles migrate hundreds to thousands of kilometres between breeding grounds and foraging grounds. All migration data from tag recoveries recorded in TREDIS for the SPREP region are shown in figure 11.

TREDIS currently holds 304 turtle migration records and these include all tag recoveries from the SPREP regional tagging programme as well as information shared with SPREP by the Queensland Parks and Wildlife Service and NOAA Fisheries and other parties who conduct turtle programmes in the SPREP region. Migration records for 21 unknown species are also recorded in TREDIS.

The migration of turtles between the SPREP region and the IOSEA region suggests that there should be some measures taken to share information and find solutions for protecting turtle populations shared by the two regions.

For detailed information on migration please refer to Appendix 8.2.

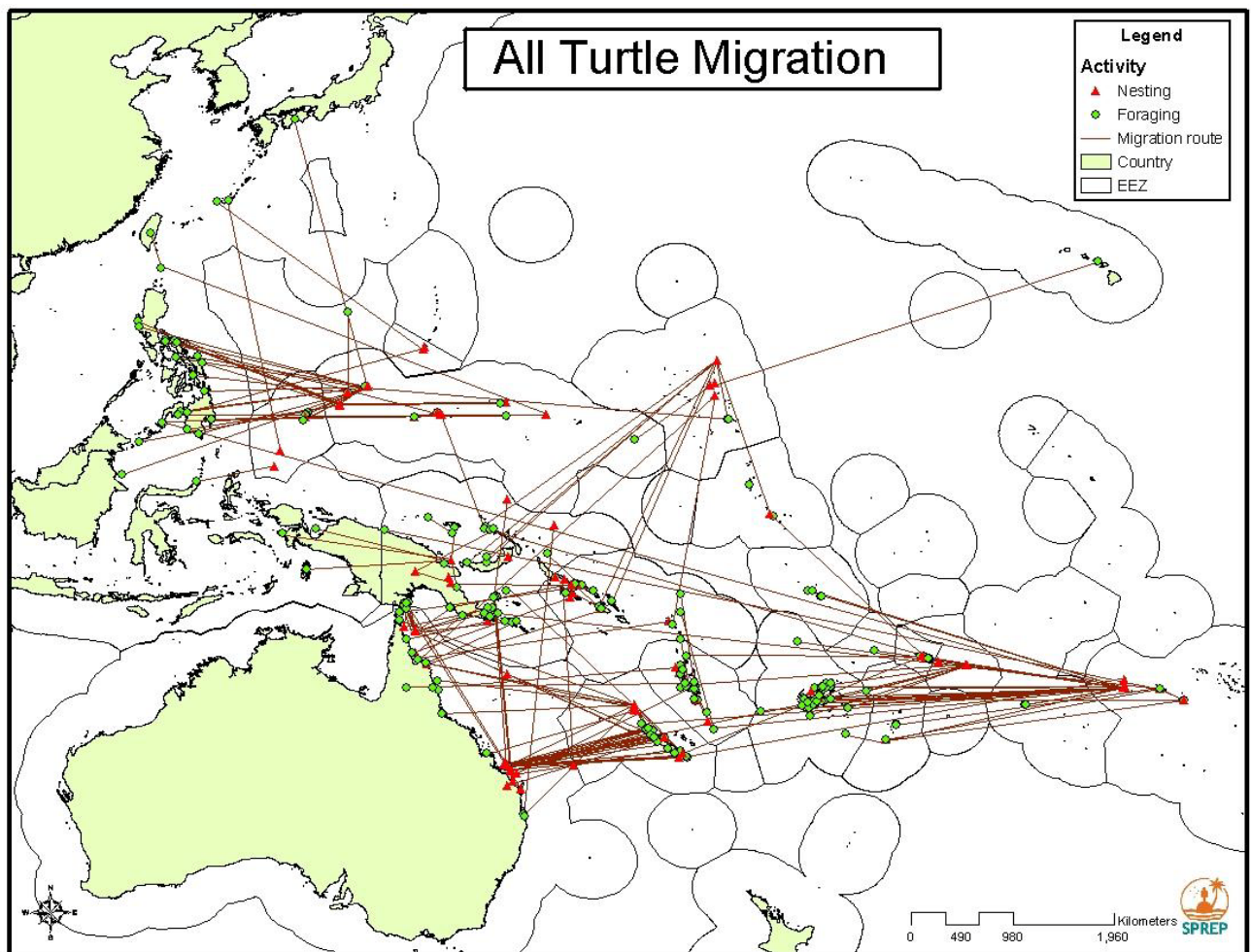


Figure 11: all turtle migration recorded in TREDIS for the SPREP region

6.1 Green Turtle Migration

The majority of tag recoveries recorded in TREDIS for the Pacific Islands region are of green turtles (figure 12) with 208 migration records. Tag recovery records from around the SPREP region show a general westward movement of breeding and juvenile turtles to foraging sites in mainly Fiji, Melanesia, Australia and Asia.

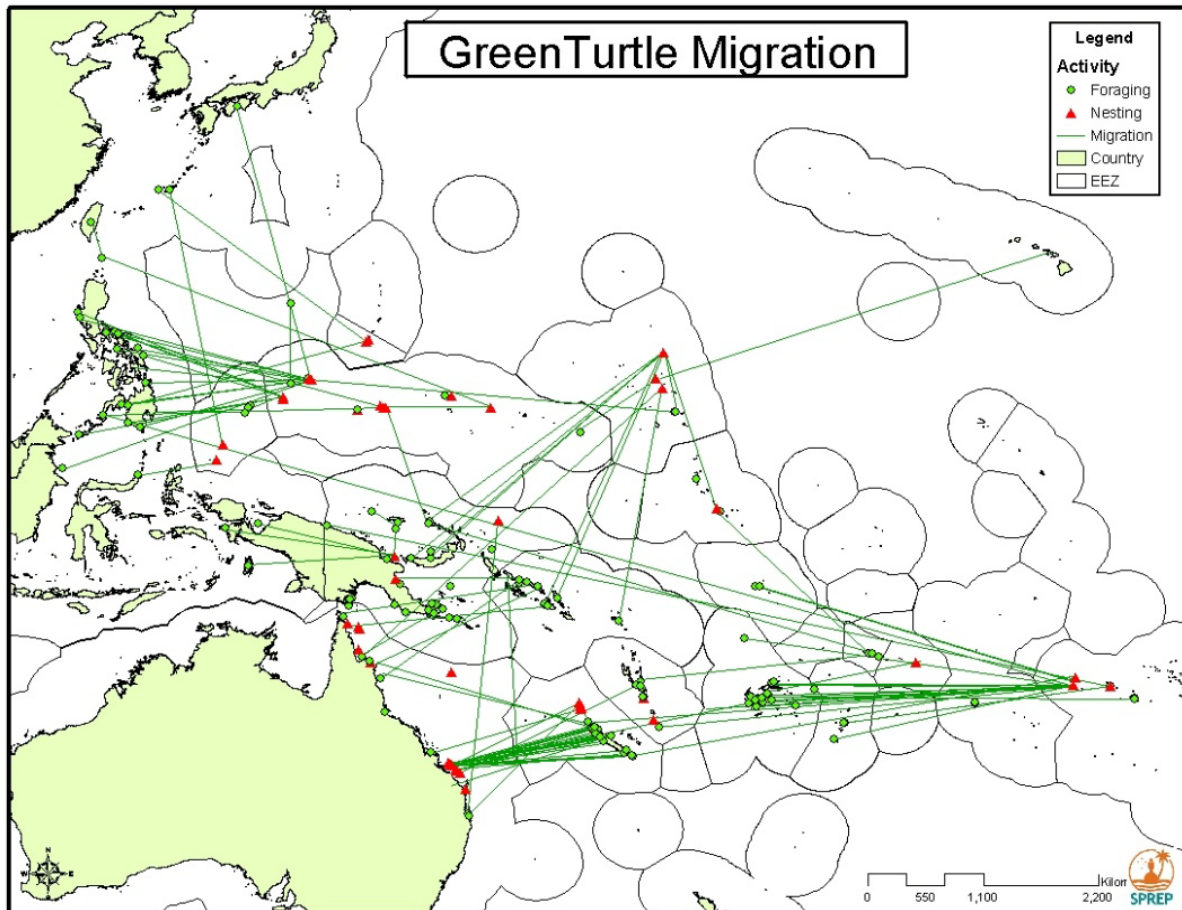


Figure 12: Green turtle migration map

Turtles tagged in French Polynesia (n = 27) migrated westward to Cook Islands (n = 2), Fiji (n = 10), Samoa (n = 2), Papua New Guinea (n = 2), Tonga (n = 5), Vanuatu (n = 2), New Caledonia (n = 2), and as far as the Philippines (n = 1).

Turtles tagged in Federated States of Micronesia (n = 29) show further westward migration to Palau (n = 6), Philippines (n = 18), Papua New Guinea (n = 1), Indonesia (n = 1), Japan (n = 1), Australia (n = 1) and one migration eastward to the Marshall Islands.

Turtles tagged in the Marshall Islands (n = 9) have been recorded as tag recoveries in Kiribati (n = 1), Solomon Islands (n = 3), Federated States of Micronesia (n = 1) and Papua New Guinea (n = 3).

Those tagged in American Samoa also show general westward movement with tag recoveries from Fiji (n = 8) and Vanuatu (n = 1). Turtles tagged in New Caledonia (n = 8) were

reported as tag recoveries from Australia indicating further westward movement in the Pacific.

Two post nesting turtles tagged in the Southwest Islands of Palau were shown to migrate westward to Indonesia and Japan respectively.

Tag recoveries reports to both the SPREP and DERM¹ (Limpus, Bell and Miller, 2009) show eastward movement of foraging turtles to nesting and foraging areas. Turtle tagged while nesting in Australia were shown to migrate eastward towards New Caledonia (n = 28) and five foraging turtles initially tagged in Australia were encountered in New Caledonia (n = 4) and Marshall Islands (n = 1).

Again, it is the PICTs with targeted and continuous tagging projects that yield the most tag recoveries.

6.2 Hawksbill turtle migration

Another species commonly encountered in the Pacific Islands region is the Hawksbill turtle *Eretmochelys imbricata* and these are shown below in figure 13. A total of 45 migration records are held in TREDIS. Further tagging surveys and data recorded in TREDIS would increase the number tag recovery reporting into the SPREP region.

¹ Queensland Department of Environment and Resource Management

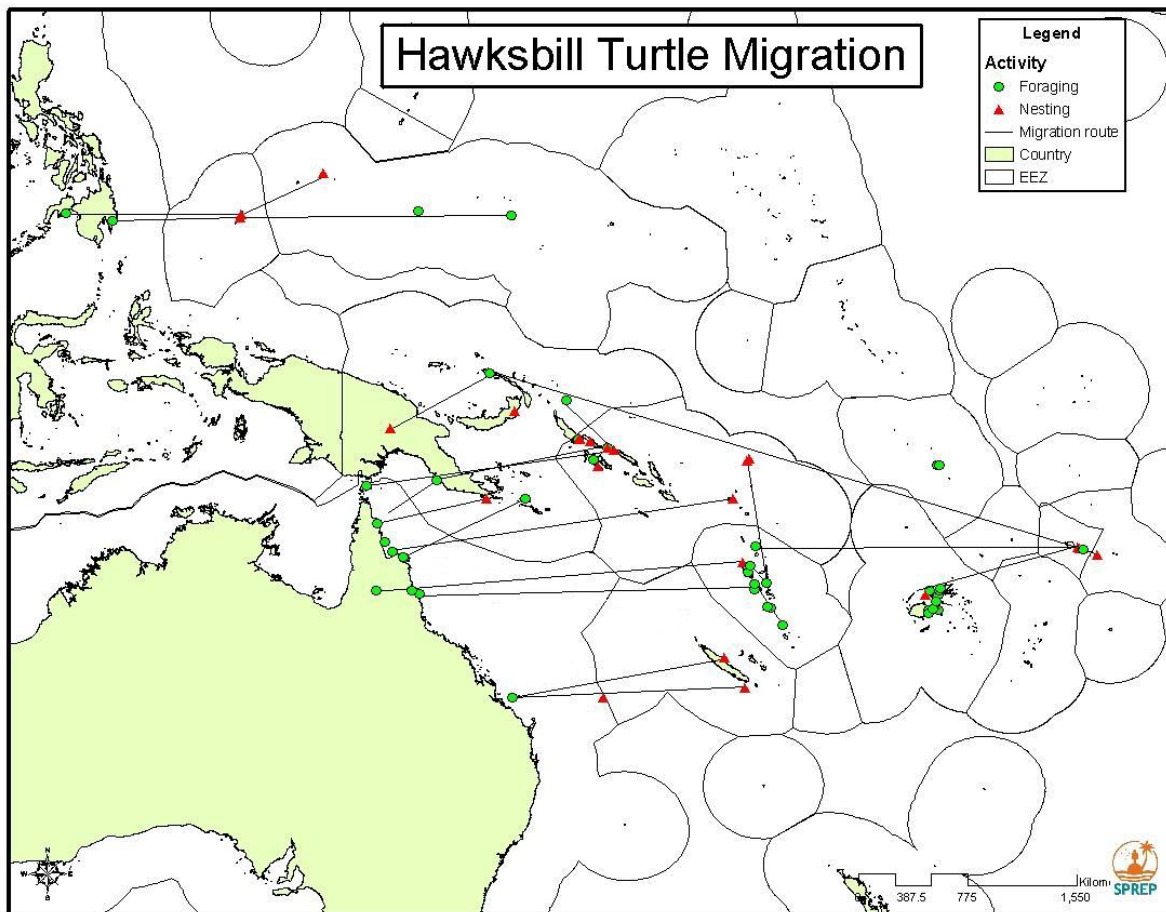


Figure 13: Hawksbill turtle migration recorded in TREDS for the SPREP region

General westward movement of the hawksbill turtle is also observed in turtles tagged in PICTs. Two turtles tagged in American Samoa were reported in neighbouring Samoa. Turtles tagged in Palau ($n = 5$) were shown to migrate westward to the Philippines ($n = 2$) with one migrating eastward to the Federated States of Micronesia. Turtles tagged in Samoa ($n = 2$) were reported as tag recoveries from Papua New Guinea ($n = 1$) and Vanuatu ($n = 1$) respectively.

The eastward movement of turtles was shown by turtles tagged in Australia ($n = 7$) and reported as tag recoveries from Papua New Guinea ($n = 3$), Solomon Islands ($n = 3$) and Vanuatu ($n = 1$).

Local tag recoveries of the turtles tagged in the Federated States of Micronesia ($n = 1$), Fiji ($n = 10$), Solomon Islands ($n = 13$) and Vanuatu ($n = 7$) indicate the possibility of local breeding populations within these PICTs.

6.3 Loggerhead turtle migration

TREDS holds fewer tag recoveries of loggerhead turtle as compared to green and hawksbill turtles (figure 10). A total of six loggerhead migration records are held in TREDS.

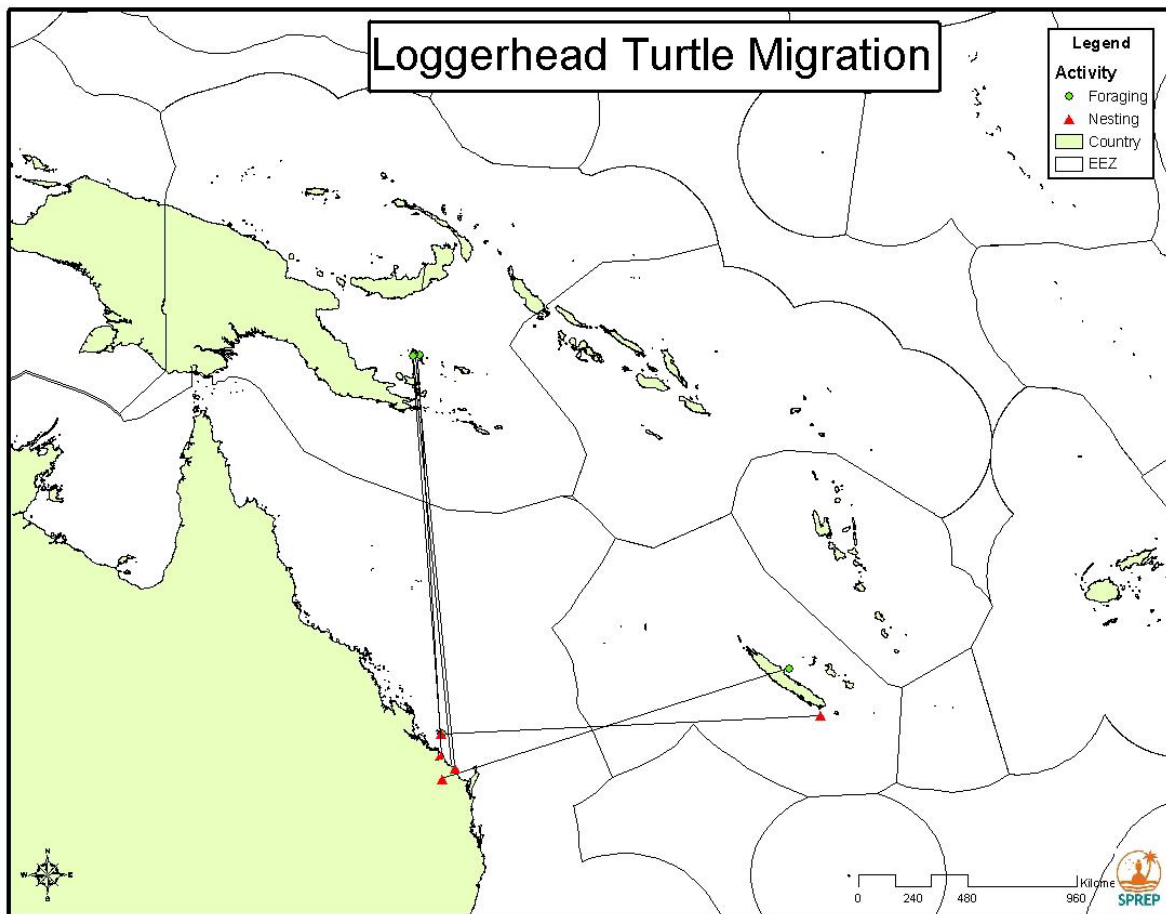


Figure 14: loggerhead turtle migration recorded in TREDS for the SPREP region

One female initially tagged on Heron Island, Australia 1991 was reported as a tag recovery from New Caledonia 1992 and then later re-encountered at Heron Island in 1992. Four post-nesting females initially tagged in Queensland, Australia were reported as tag recoveries from Papua New Guinea. Another loggerhead female initially tagged while nesting on Heron Island was reported as a tag recovery from North New Caledonia.

6.4 Olive Ridley turtle migration

One sub-adult Olive Ridley was satellite tagged and released in Borabora, French Polynesia and the last signal received from this turtle was in the pelagic waters of the release site

7 Conclusion

TREDS currently holds data supplied by various government agencies, NGOs and community groups throughout the Pacific region who are involved in turtle management and conservation activities. The implementation of TREDS led to collation of data that was originally stored in various sources to stored in one central database and allow for the identification of nesting and foraging areas as well as migration patterns throughout the Pacific region. For example, tag recovery information from within the SPREP secretariat and from other sources recorded in TREDS further shows evidence that marine turtles in the Pacific are a shared resource not only amongst PICTs, but beyond as shown by migration to the Philippines, Indonesia, Taiwan and Japan.

Furthermore, the implementation of the TREDS project improved storage and recall of tag recoveries recorded in TREDS and if the tag is not yet recorded in TREDS, the tag inventory holds the details of where and to whom a particular tag was given.

Most of the Pacific Island countries consist of many islands scattered over large areas of ocean. This geographical barrier combined with limited resources makes it difficult to have continued monitoring throughout long periods of time. In many areas the intensity of monitoring is very much dependent on enthusiastic and determined individuals such as Wan Smolbag Vanua tai monitors, the Tetepare Descendents Association, the research work on Ulithi and in Yap, FSM, Fondation Hibiscus and the Association Pour la Sauvegarde de la Nature Néo-Calédonienne that drive turtle conservation work in these areas. Despite this level of action, information on turtles in the Pacific region is still not comprehensive as in many cases research and awareness is only carried out when funding is available. An increase in turtle management and conservation, and subsequent tagging programmes is required, not only for better understanding of turtle populations in the Pacific region, but also to increase the value of TREDS in providing advice to PICTs on their turtle resources.

Majority of the foraging turtle records in TREDS for the PICTs are from continued tagging in French Polynesia, Solomon Islands and Vanuatu and more recent research carried out in Commonwealth of the Northern Marianas. The tagging of foraging turtles in Fiji are of turtles that have captive reared and then released into the wild and tag recoveries of turtles tagged in Fiji and elsewhere. Other PICTs such American Samoa, Cook Islands, Guam, Tuvalu, Kiribati, Samoa, Tonga, Marshall Islands, New Caledonia, Palau, Papua New Guinea only record foraging turtles when these turtles are encountered by individuals.

More continuous nesting and foraging surveys are needed in the Pacific. In the case that this information is collected, it is important that TREDS be utilised by PICTs as they indicated in the Marine Turtle Action Plan that implementation of TREDS as an important component of turtle conservation in the Pacific.

7.1 Recommendations

1. TREDS users should ensure regular exchange of information with the SPREP secretariat so tag recoveries can be easily followed up and reported back. Regular data exchange also ensures that backup of your database is available from SPREP in the event of computer or software failure.
2. Government agencies, NGOs and other groups should ensure that there are always personnel who can use TREDS, and should contact SPREP Turtle database Officer for assistance and training if the person responsible for TREDS changes.
3. Users should ensure that data is checked and entered immediately to avoid data loss and allows data checks will data collectors while information is still remembered.
4. Users should report tagging activities, tag recovery and interaction events in a timely manner to the SPREP secretariat to allow annual reporting of results/output.
5. Areas with identified nesting sites should continue monitoring in these areas and input this data into TREDS. Contact SPREP for assistance with nesting surveys.
6. PICTs are encouraged to conduct foraging surveys as they are just as important as nesting surveys and to enter this information into TREDS. Contact SPREP for assistance.

If you need any assistance with TREDS or would like to begin using TREDS please contact the SPREP Associate Turtle Database Officer at sprep@sprep.org for details.

8 Appendices

8.1 TREDIS User Manual

The Turtle Research and Monitoring Research Database System (TREDIS) User Manual provides TREDIS users with guideline and instruction on how to download and utilise TREDIS as tool for turtle research. The TREDIS user manual is available at SPREP at <http://www.sprep.org/treds/TREDISnews.aspx>.

8.2 TREDIS Country Reports

American Samoa

1 Tag inventory

1.1 Tags distributed by SPREP

Of the 479 tags that have been recorded as distributed, only 26 (5.42%) are recorded in TREDIS.

1.2 Tags distributed by other agencies

Currently, there are 171 tags from other agencies recorded in TREDIS.

1.3 Untagged Turtles

The numbers of untagged turtles recorded in TREDIS for American Samoa are 27 green turtles, 14 hawksbill turtles and 18 unidentified turtle species.

2 Species Occurrence by site

The most common species recorded in TREDIS for American Samoa is the green turtle (n=88) followed by the hawksbill turtle (n=59). The majority of green turtles (n=72) were recorded at Rose Atoll. A lone olive ridley and 3 unidentified species were also reported.

3 Size Frequency by species

3.1 Olive Ridley turtle size frequency

TREDIS holds one record of an Olive Ridley turtle encounter in American Samoa. The size of this turtle is within the 50.0 – 54.9 CCL size class range.

3.2 Green turtle size frequency

Size frequency for green turtles recorded in TREDIS for American Samoa (n=41) show 10 juveniles within the 15.0 – 59.9cm CCL size range, six sub-adults within the 70.0 – 84.9cm CCL size range and 25 adult sized turtles within the 90.0 – 114.9cm CCL size range. This may be the result of surveys being conducted mainly on Rose Atoll, the main nesting area for green turtles in American Samoa, and subsequently, larger nesting females are encountered during survey periods. The smaller juvenile and sub-adults green turtles were mostly encountered around Tutuila Island. No known emergence surveys have been conducted in American Samoa.

3.3 Hawksbill turtle size frequency

Size frequency for hawksbill turtles recorded in TREDIS for American Samoa (n=59) show that most encountered size to be juveniles within the CCL size range of 0.0 – 59.9 cm (n = 53) followed by four sub-adults within the 70.0 - 84.9cm CCL size range and 2 adults within the 90.0 – 99.9cm CCL size range.. Hawksbill turtle records for American Samoa are predominately one-off turtle encounters around the island of Tutuila.

4 Turtle nesting in American Samoa

4.1 Green turtle nesting

All green turtle nesting recorded in TREDIS for American Samoa are from Rose Atoll, with a total of 41 green turtles recorded as nesting on Rose Atoll between 1971 and 1993.

4.2 Hawksbill nesting

All of the hawksbill nesting recorded in TREDIS as nesting in American Samoa has been recorded on the island of Tutuila, with a total of six turtles recorded. It is possible that more nesting is occurring on Tutuila and other islands in American Samoa, but more surveys are needed to confirm nesting sites.

4.3 Unidentified species

One unidentified species of turtle was recorded as nesting at Fagalii on the island of Tutuila.

5 Tag recoveries

All tag recoveries recorded in TREDIS for American Samoa are from turtles that have been tagged in American Samoa and migrated out to other PICTs.

5.1 Green turtles

Eight of the post-nesting green turtles tagged at Rose Atoll were re-encountered in Fiji indicating that this may be a major foraging area for green turtles in the Pacific as other Pacific islands such as French Polynesia show similar migration trends towards Fiji. The tag recovery of one post-nesting female green turtle initially tagged at Rose Atoll was reported from Vanuatu. Another post-nesting female green turtle fitted with satellite transmitter at Rose Atoll stopped transmitting signals near Raiatea in French Polynesia.

5.2 Hawksbill turtles

TREDIS also contains one record of a hawksbill turtle that was initially tagged in American Samoa and later recaptured (and released) in Samoa. A post-nesting hawksbill turtle that was fitted with a satellite transmitter in Tutuila and swam westward and the last signal received was positioned off to the southwest of islands of Savaii and Upolu in Samoa.

Commonwealth of the Northern Marianas Islands

1 Tag inventory

1.1 Tags distributed by SPREP

Of the 600 tags distributed to the CNMI only 101 tags (16.8%) have been recorded as been applied to a turtle in TREDIS.

1.2 Untagged turtles

Sixty-two untagged green turtles and 15 unidentified species are recorded in TREDIS for CNMI.

2 Species Occurrence by Site

The most abundant marine turtle species recorded in TREDIS for CNMI is the green turtle with 111 records. 15 unidentified species and 5 hawksbill turtles are also recorded in TREDIS.

3 Size Frequency by species

3.1 Green turtle size frequency

The size frequency graph for Green turtles recorded in TREDIS for CNMI (n=83) shows 64 juveniles within the 35.0 – 64.9cm CCL size class range, 13 sub-adult turtles within the 65.0 – 79.9cm CCL size class ranges and 6 adult sized turtle within the 95.0 - 109.9cm CCL size class range.

3.2 Hawksbill turtle size frequency

TREDIS hold five records of hawksbill turtles, which have a size frequency within the 40.0 – 54.9cm CCL size class ranges.

4 Nesting Turtles by site

Seven green turtles are recorded in TREDIS as nesting for CNMI. Two green turtles were observed nesting on Tank Beach in 2003 and then one turtle was observed in 2008. In 2007 nesting was observed at Bird Island (n = 2), Objan Beach (n = 1) and Wing Beach (n = 1). Targeted surveys should be continued in these sites to confirm the populations at these sites.

5 Tag recoveries

Only one tag recovery is recorded in TREDIS for the CNMI of an unidentified turtle species that was initially tagged in CNMI and was found beachwashed at Barinas Cove Beach.

Cook Islands

1 Tag inventory

Of the 600 tags that have been recorded as distributed to the Cook Islands by SPREP only 18 (3%) are recorded in TREDIS. TREDIS holds no records of untagged turtle for the Cook Islands.

2 Species Occurrence by Site

A total of 16 turtles are recorded in TREDIS for the Cook Islands. The two species of turtle recorded in TREDIS for the Cook Islands are the hawksbill turtles (n = 4) and green turtles (n = 9). Three unidentified species are also recorded in TREDIS. The 2 green turtles encountered in Palmerston Atoll were post-nesting females that have migrated from a nesting ground in French Polynesia.

3 Size Frequency by species

All species recorded in TREDIS for the Cook Islands are juveniles which were reported randomly to the Ministry of Marine Resources and the Environment Service. There are no tags as a result of targeted surveys recorded in TREDIS. Seven green and four hawksbill turtle records in TREDIS for Cook Islands had CCL measurements.

4 Nesting Turtles in Cook Islands

TREDIS holds no records of nesting turtles for the Cook Islands.

5 Tag recoveries

Only two tag recoveries have been recorded in TREDIS for the Cooks Islands and these were turtles that were tagged initially in Scilly Atoll, French Polynesia. Palmerston Atoll may be a foraging site for Green turtles in the Pacific but more data is required to establish this.

Federated States of Micronesia

1 Tag inventory

1.1 Tags distributed by SPREP

The inventory records all known flipper tags distributed by SPREP to the Yap Marine Resources Management Division, the Oceanic Society, the National Ocean Resource Management Authority and the Pohnpei Division of Marine Development. Of the 6650 tags distributed to the FSM, only 2596 tags (39.0%) have been recorded as been applied to a turtle in TREDIS.

1.2 Other Tags used in the FSM

A total of 191 non SPREP tags recorded in TREDIS for FSM consist of 182 flippers tags and 9 PIT tags. The eight PIT tags were applied to turtles in conjunction with SPREP flipper tags on Ulithi Atoll in Yap State.

1.3 Untagged turtles

Untagged turtles can also be recorded in TREDIS. One untagged green turtle and one untagged hawksbill turtle are recorded in TREDIS for FSM.

2 Species Occurrence by Site

The most abundant marine turtle species recorded in TREDIS for FSM is the green turtle with 1995 records. 18 unidentified species and 15 hawksbill turtles are also recorded in TREDIS. The majority of records in TREDIS are from Ulithi Atoll namely Gielop Island, and may be that of the rigorous surveying that has taken place on this island in 1991, 2005, 2006 and 2007. Other new sites that have been added to surveys on Ulithi are Iar and Loosiep.

The most surveyed state in the FSM is Yap State. More targeted surveys should be carried out in other states of FSM to identify other important nesting and foraging areas other than those that have been identified in Yap State.

3 Size Frequency by species

3.1 Green turtle size frequency

The size frequency for green turtles recorded in TREDIS for the Federated States of Micronesia (n=623) shows 21 juvenile turtles within the 45.0 – 64.9cm CCL size ranges, one turtle sub-adult within the 70.0 – 74.5cm CCL size range and 601 adult sized turtles within the 85.0 – 134.9cm CCL size ranges.

The majority of turtles recorded in TREDIS for FSM are those of breeding turtles from the state of Yap. Hatchling and emergence data may also be collected but may not have been included in TREDIS.

3.2 Hawksbill turtle size frequency

The size frequency graph for hawksbill turtles recorded in TREDIS for FSM (n=13) shows 12 juveniles within the CCL size range of 30.0 – 54.9cm and one adult sized turtles within the CCL range of 95.0 – 99.9cm.

4 Nesting Turtles by site

4.1 Hawksbill turtle nesting

Only one hawksbill turtle was recorded in TREDIS as nesting at Iar Island, Ulithi Atoll in 2005.

4.2 Green turtle nesting

The majority of nesting green turtles recorded in TRED for FSM have been from surveys conducted in the state of Yap, namely the atolls of Elato, Lamotrek, Ngulu, Olimarao, Ulithi and Woleai. The most surveyed island is Gielop Island in the Ulithi Atoll (n = 1215) with surveys being carried out during

nesting season in 1991, 2005, 2006 and 2007. These numbers indicate that Gielop Island is an important nesting site for green turtles in FSM. Further surveys should be carried out in other identified nesting areas to further confirm important nesting areas as well as identify nesting areas in the other states of Micronesia.

5 Tag recoveries

5.1 Turtles tagged outside FSM

One post-nesting green turtle that was initially tagged on Jemo Island, Marshall Islands was reported as a tag recovery from Kosrae Island. A juvenile hawksbill turtle that was tagged on Malakal Island in Palau was reported as a tag recovery from Weno Island.

Turtles tagged in FSM

5.1.1 Local tag recoveries

a. Elato Atoll

One breeding male green turtle and one post-nesting female green turtle that were initially tagged at Elato Atoll were reported from Lamotrek and Woleai Atolls respectively.

b. Ulithi Atoll

Eight post-nesting green turtles from Gielop Island, Ulithi Atoll were reported from Yap Island (n = 2) and Ulithi Atoll (n = 6).

c. Ngulu Atoll

Six nesting turtles that were initially tagged on Ngulu Atoll were reported as tag recoveries from Ngulu Atoll (n = 3), Ulithi Atoll (n = 1), Fananu Island (n = 1) and West Fayu Island (n = 1).

d. Olimarao Atoll

Two male green turtles that were tagged during courtship in Olimarao Atoll were reported as tag recoveries from Woleai and Elato Atolls respectively. Two post-nesting green females tagged while nesting on Olimarao Atoll were reported from Elato Atoll. One juvenile hawksbill turtle tagged in Olimarao while reported back in Olimarao about 2 years after it was initially tagged.

e. Yap Island

One juvenile green turtle initially tagged in Yap Island was reported as a tag recovery back in Yap Island.

5.1.2 International tag recoveries

a. Elato Atoll

Two post-nesting females initially tagged in Elato were reported as tag recoveries from New Hanover, Papua New Guinea and Western Mindanao, Philippines.

b. Federated States of Micronesia

One green turtle was tagged and released by an observer onboard a Japanese Purse seiner in FSM waters was reported as a tag recovery when the turtle was washed up dead on a beach in the Sovereign Island, South Queensland in Australia. Another unidentified species of unknown origin (tag was sent to FSM) was reported from Southern Leyte in the Philippines.

c. Gielop Island, Ulithi Atoll

13 post-nesting female turtles initially tagged on Gielop Island were reported as tag recoveries from Indonesia (n = 1), Japan (n = 1), Palau (n = 4) and the Philippines (n = 7).

d. Ngulu Atoll

Seven post-nesting green turtles initially tagged while nesting Ngulu were reported as recoveries from the Philippines.

e. Oroluk Island, Oroluk Atoll

One post-nesting green turtle that tagged while nesting on Oroluk Island was reported as a tag recovery from Palau.

5.1.3 Turtles encountered more than once

Three female green turtles were encountered twice in their nesting site of Gielop Island before they migrated and then reported as tag recoveries from Palau, Philippines and Marshall islands respectively. Another nesting green female was encountered twice while nesting on Elato Atoll before it left to migrate to its foraging area and was reported as a tag recovery from the Philippines.

Fiji

1 Tag Inventory

1.1 Tags distributed by SPREP

Of the 1811 tags that have been recorded as distributed to Fiji by SPREP only 78 (4.3%) are recorded in TREDIS. Some of the tag numbers have been reported as tag recoveries from Fiji yet no initial tagging data has been reported.

1.2 Other tags used in Fiji

Other flipper tags were also supplied to Fiji by the US National Marine Fisheries Service. These tags are smaller and were used to tag juvenile turtles released after being reared in captivity on Treasure Island Resort and Makogai Island. A total 387 non-SPREP flippers are recorded in TREDIS as being applied to turtles in Fiji.

1.3 Untagged Turtles

Records of untagged turtles can also be entered in TREDIS. There are no untagged turtle records for Fiji in TREDIS.

2 Species Occurrence by Site

The most abundant marine turtle species recorded in TREDIS for Fiji is the hawksbill turtle (n = 363) with the majority of these recorded from the captive rearing programmes at Treasure Island Resort and Makogai Island. Green turtles (n = 27) are less common. A further 12 unidentified species are also reported

Records for hawksbill turtles from sites other than Treasure Island and Makogai are encounters of random individuals that have been tagged and released or reports of tag recoveries from Fiji. There is need for intensive surveys to determine important foraging and nesting areas within Fiji.

3 Size Frequency by species

3.1 Green turtle size frequency

The size frequency of green turtles recorded in TREDIS for Fiji (n=12) shows eight juveniles within the CCL size class range of 40.0 – 64.9cm, two sub-adults within a 70.0 – 74.9cm CCL size class range and two adult turtles within 90.0 – 104.9cm CCL size class ranges. It is most probable that there are more green turtles and more surveys are needed to get a better idea of the green turtle population in Fiji.

3.2 Hawksbill turtle

The size frequency of hawksbill turtles recorded in TREDIS for Fiji (n=356) shows that the majority of hawksbill turtles encountered in Fiji to be juveniles within the CCL size range of 10.0 – 59.9 cm followed 2 sub-adults within the 65.0 – 79.9cm CCL size class range and 5 adult sized turtles within the 80.0 – 94.9cm CCL size class range. These juvenile records are from turtles that were captive reared, tagged and released from Treasure Island Resort.

4 Nesting Turtles by site

4.1 Green turtle nesting

Only one green turtle is recorded in TREDIS as nesting in the Lau Group of Fiji in 1992. There is a paucity of data on green turtle nesting and subsequently, more targeted surveys in identified nesting areas are required.

4.2 Hawksbill turtle nesting

A total of four hawksbill turtles have been recorded in TREDIS as nesting.

5 Tag recoveries for Fiji

5.1 Turtle Migration into Fiji

All tag recoveries recorded in TREDIS are from turtles migrating into Fiji and these are mainly of green turtles and one hawksbill turtle. Tag recoveries of green turtles are from Australia (n = 1), French Polynesia (n = 10), and American Samoa (n = 8). These are mostly post-nesting adults, and subsequently Fiji maybe a major foraging ground for green turtles in the Pacific and therefore an important area for turtle conservation. There is also one tag recovery recorded in TREDIS of a green turtle that was initially tagged in Tonga but its size is unknown.

For the hawksbill turtles, there is only one record of a post-nesting female hawksbill that was initially tagged in Samoa. This turtle was fitted with a satellite transmitter and the last transmission signal was recorded off the northwest coast of the Vanua Levu in Fiji.

5.2 Turtles tagged in Fiji

All the tag recovery records held in TREDIS for turtles have been turtle originally tagged in Fiji. The records in TREDIS of turtle tagged in Fiji include 10 hawksbill turtles, one green turtle and two unidentified species. There are no outward migration tag recoveries in TREDIS for turtles tagged in Fiji. Six tag recoveries of turtles tagged in Fiji have no initial tagging data recorded in TREDIS.

Satellite tagging of post-nesting Hawksbill turtles (n = 2) in Fiji showed that the two turtle species never left Fiji waters. Although results are minimal it is possible that the hawksbill turtle population may be localised population but more surveying is needed to confirm this.

French Polynesia

1 Tag inventory

1.1 Tags distributed by SPREP

The inventory records all known flipper tags distributed by SPREP to the Direction de l'Environnement Quarter de la mission, Service de la Pêche and the Fondation Hibiscus. The French Polynesia government also orders their own flipper tags for turtle tagging and other local NGOs such as Te Mana o te Moana and others use these tags for tagging and report their tagging activities to SPREP. Of the 2873 tags distributed to French Polynesia only 1050 (36.5%) tags have been recorded as been applied to a turtle in TREDIS.

1.2 Tags distributed by other agencies

TREDIS further records known tag series that have been used in French Polynesia supplied by other agencies such as the US National Marine Fisheries Service as well as tags that were purchased directly the manufacturer. The information on these tag series were collated from all the tagging datasheets and/or reports that were supplied to SPREP by the French Polynesia government and George Balazs of the US National Marine Fisheries Service. Of the 4706 tags received only 1144 (24.3%) tags have been recorded in TREDIS as being applied to a turtle.

1.3 Untagged turtles

Untagged turtles can also be recorded in TREDIS. One hawksbill turtle and four green turtles are recorded as untagged turtles in TREDIS for French Polynesia.

2 Species Occurrence by Site

The predominant species recorded in TREDIS for French Polynesia are the green turtles (n = 1551), followed by hawksbill turtles (n = 54). There is one Olive Ridley recorded and 94 unidentified species. All of the records in TREDIS for French Polynesia are from the Leeward Group and this is mainly because this is the area that has regular surveys. Other islands in French Polynesia would need to be surveyed to gain a better understanding of turtle populations.

As mentioned, the turtles recorded from Tahaa are turtles that have been tagged and released by Fondation Hibiscus. There are further records in excel spreadsheet from the Te Mana o Te Moana turtle clinic in Moorea that need to entered into TREDIS.

3 Size Frequency by species

3.1 Hawksbill turtle size frequency

The size frequency of hawksbill turtles recorded in TREDIS for French Polynesia (n=50) shows that 44 juveniles within the CCL size range of 30.0 – 64.9 cm, four turtles within the sub-adult CCL size range of 70.0 – 74.9cm and one adult sized turtle within the CCL size range of 85.0 – 89.9cm.

All of the hawksbills recorded in TREDIS from French Polynesia are turtles that been captive reared by the Fondation Hibiscus in turtle preserve at the Hibiscus Hotel on Tahaa. These are turtles that have been purchased from fishers and are the tagged and released.

3.2 Green turtle size frequency

The size frequency for green turtles recorded in TREDIS for French Polynesia (n=1504) shows a bimodal distribution corresponding to the two age classes of turtles are being encountered and measured. The most encountered group were juveniles (n = 929) within the CCL range of 10.0 – 59.9cm followed by adult sized turtles (n = 563) within the CCL range of 85.0 – 124.9cm. There were only 9 records of animals within the sub-adult CCL size class of 65.0 – 84.9cm.

The majority of adult sized green turtles recorded ($n = 563$) were animals tagged and released from Bellinghausen and Scilly Atolls. The majority of juvenile sized turtles recorded were animals that were either seized or bought at Tahiti and Tahaa and then tagged and released.

4 Nesting Turtles by site

Only Green turtles have been recorded in TREDIS as nesting in French Polynesia with Scilly Atoll having the highest records with a total of 449 (tagged over a span of 6 years) followed by Bellinghausen with 33 turtles recorded from one survey in 1991. All nesting surveys recorded in TREDIS are from the Scilly and Bellinghausen Atolls.

Nesting surveys such as those that have been conducted on Scilly and Bellinghausen Atolls should be expanded to other known nesting sites to identify other important nesting sites in French Polynesia. The intensive nesting surveys on Scilly Atoll have further resulted in a better understanding of migration for turtles nesting on this Atoll.

5 Tag recoveries

All the tag recoveries associated with French Polynesia recorded in TREDIS provides important information on various potentially important nesting and foraging areas in the Pacific.

5.3 Turtle migration into French Polynesia

The one record of a nesting turtle migrating into French Polynesia is of a post-nesting green turtle from Rose Atoll in American Samoa that was fitted with satellite transmitter. The last signal received from this turtle was near Raiatea Island in French Polynesia.

5.4 Turtles tagged in French Polynesia

5.4.1 Nesting turtles

Tag recoveries for 14 post-nesting green turtles initially tagged on Scilly Atoll were reported from Fiji ($n = 8$), New Caledonia ($n = 1$), Philippines ($n = 1$), Tonga ($n = 1$), Tuvalu ($n = 2$) and Vanuatu ($n = 1$). Another tag recovery was reported from New Caledonia of a post-nesting green turtle that was initially tagged on Bellinghausen Atoll. These tag recoveries clearly show that green turtle nesting in French Polynesia migrate widely.

Another two female green turtles were fitted with satellite transmitters and released from Borabora. The last signals received from the two females were from Mopelia/Maupihaa and Tupai respectively showing that these females were possibly returning to their nesting areas.

Two adult male green turtles were also released from Borabora fitted with satellite transmitters. The last signal received from one of these male green turtles was near Aneityum Island in Vanuatu while the last signal received from the other male was from near Mopelia/Maupihaa Atoll where it was initially captured. It may be that the first male was returning back to its foraging area while the second had returned back to the nesting area to continue breeding.

TREDIS holds one record of a nesting green turtle tagged initially in Scilly Atoll that migrated to Tonga and later returning to French Polynesia.

5.4.2 Juvenile turtles

Tag recoveries of five juvenile green turtles tagged and released from Scilly Atoll were reported from Cook Islands ($n = 2$), Fiji ($n = 1$) and Samoa ($n = 2$). Tag recoveries of six juvenile green turtles tagged and released from Tahaa Island were reported from French Polynesia ($n = 1$), Papua New Guinea ($n = 2$) and Tonga ($n = 4$). The tag recovery of one juvenile green turtle tagged and released from Tahiti was reported from Fiji. All of these recoveries further show Cook Islands, Fiji, Samoa, Papua New Guinea and Tonga as important foraging areas for green turtles from French Polynesia and possibly other Pacific Islands.

A juvenile Olive Ridley was tagged, fitted with satellite transmitter and released from Borabora. The last signal received from this turtle indicated that the turtle remained in area where it was released.

5.4.3 Turtles of unknown maturity

The tag recoveries for two unknown species and maturity were reported from Raiatea and Tahaa Islands respectively.

Guam

1 Tag inventory

1.1 Tags distributed by SPREP

Of the 200 tags distributed by SPREP the Division of Aquatic and Wildlife Resources only 12 (6%) have been recorded in TREDIS.

1.2 Other tag used in Guam

The complete number and tag series distributed to Guam by other agencies is not known. 33 non-SPREP tags have been recorded in TREDIS as applied to turtles in Guam.

1.3 Untagged turtle

Untagged turtles can also be recorded in TREDIS. The untagged turtles recorded in TREDIS for Guam include 254 green turtles, 18 hawksbill turtles, 1 leatherback turtle and 6 unidentified species.

2 Species occurrence by site

A total of 314 turtles are recorded in TREDIS for Guam. The species recorded are green turtles (n = 280), hawksbill turtles (n = 27), one leatherback turtle, and six unidentified species. Records of Interactions with turtles in TREDIS have been recorded by DAWR since 1975. Many of these are incidents of when a turtle is reported to DAWR. The high occurrence of green turtles observed at Coco Island and the Andersen Air Base may be due to more turtles being observed and recorded in these areas.

One leatherback turtle was washed dead on Ritidian Beach. Observations made concluded that the turtle attacked by a shark. Another record is of a hawksbill hatchling smuggled from Palau was confiscated at the airport and returned to Palau.

3 Size Frequency by species

3.1 Green turtle size frequency

Only green turtle records had CCL measurements in TREDIS for Guam (n=15). The size frequency for green turtles recorded in TREDIS for Guam shows four juveniles within the 20.0 – 44.9cm CCL size classes, one sub-adult sized turtle within the 80.0 – 84.9cm CCL size class ranges and 10 adult sized turtles within the 95.0 – 139.9cm CCL size class ranges.

3.2 Hawksbill size frequency

The size frequencies of two juvenile hawksbill turtles were within the 30.0 – 59.9cm CCL size class ranges.

4 Nesting Turtles by site

4.1 Hawksbill Turtle nesting

A total of 12 hawksbill turtles are recorded in TREDIS as nesting in Guam. Data appears sparse and more targeted nesting surveys are required to identify nesting sites.

4.2 Unidentified species nesting

A total of four unidentified turtle species are recorded as nesting in TREDIS for Guam.

4.3 Green turtle

A total of 211 green turtles were recorded as nesting in Guam. The green turtle appears to be more abundant species nesting in Guam but again more targeted surveys are needed to identify important green turtle nesting sites.

The majority of nesting is recorded on at Cocos Island West Side Government End (n = 84) and this area may have been regularly surveyed by DAWR. Turtle patrolled by the military personnel at the EOD site (n = 34) and reported to DAWR regularly. Other records of nesting turtle on Guam are not a result of surveys but of residents reporting turtle encounters to DAWR.

Nesting recorded in other areas include Castro Beach (n = 1), Cetti Bay (n = 1), Falcona Beach (n = 4), Ipao Park (n = 3), Jinapsan (n = 25), Nomna Bay (n = 3), Ritidian (n = 9), Sella Bay (n = 3), Sumay Marina (n = 1), Tagachang (n = 1) Tarague Beach (n = 11), Togcha (n = 1), Urunao (n = 27) and unrecorded site (n = 1).

5 Tag recoveries

5.1 Turtle tagged in Guam

Two post-nesting green turtles initially tagged in Guam were reported from Mindanao, Philippines and Kumejima, Japan respectively.

Kiribati

1 Tag inventory

1.1 Tags distributed by SPREP

Of the 200 tags distributed to Kiribati by SPREP only 24 (12%) have been recorded in TREDIS.

1.2 Untagged turtles

Untagged turtles can also be recorded in TREDIS. Three untagged green turtles are recorded in TREDIS for Kiribati.

2 Species Occurrence by Site

The only species of marine turtle recorded in TREDIS for Kiribati is the green turtle with 17 animals. 16 records are of turtle that were tagged in Tarawa Atoll while one record is from tag recovery report.

3 Size Frequency by species

Only 12 records of green turtle recorded in TREDIS for Kiribati had CCL measurements. The size frequency for green turtles recorded in TREDIS for Kiribati shows eight juveniles within the CCL size class range of 40.0 – 64.9cm, 2 sub-adults within the 65.0 – 74.9cm CCL size class range and two adult sized turtles within the CCL size class range of 90.0 – 104.9cm. The collection of more data for incorporate into TREDIS will yield a better picture of the turtle populations in Kiribati.

4 Nesting Turtles by site

Only one green turtle has been recorded as nesting based on a hatched clutch at Noto Islet on Tarawa Atoll. Hatchlings were not counted or measured.

5 Tag recoveries

Only one international tag recovery is recorded for Kiribati and this is of a post-nesting adult green turtle that was initially tagged at Bikar Atoll in Marshall Islands. A local tag recovery was made of a green turtle in 2009 that was initially tagged in 2007.

Republic of the Marshall Islands

1 Tag inventory

1.1 Tags distributed by SPREP

Of the 1220 tags distributed to the Marshall Islands only 212 (17.3%) tags have been recorded as been applied to a turtle in TREDIS. 500 tags (R5901 – R6400) were returned to SPREP via George Balazs.

1.2 Tags distributed by other agencies

Two non-SPREP tags are also recorded in TREDIS as being applied to a turtle in The Marshall Islands.

1.3 Untagged turtles

Untagged turtles can also be recorded in TREDIS. No untagged turtles are recorded in TREDIS for the Marshall Islands.

2 Species Occurrence by Site

The predominant species recorded in TREDIS for the Marshall Islands are the green turtles (n = 79), followed by four hawksbill turtles. More surveys are needed in the Marshall Islands to identify important foraging and nesting sites.

3 Size Frequency by species

3.1 Hawksbill turtle size frequency

The size frequency of the four hawksbill turtles recorded in TREDIS for the Marshall Islands shows three juveniles within the 30.0 – 44.9cm CCL size class range and one sub-adult within the 65.0 – 69.9cm CCL size class range.

3.2 Green turtle size frequency

The size frequency of green turtles recorded in TREDIS for the Marshall Islands (n=71) shows 10 juvenile green turtles within the 35.0 – 54.9cm CCL size class ranges and 61 adult sized turtles within the 80.0 – 124.9cm CCL size class ranges.

4 Nesting Turtles by site

Only Green turtles have been recorded in TREDIS as nesting in the Marshall Islands with the most records being recorded at Bikar Atoll (n = 47). Nesting was also observed on Erikub Atoll (n = 7) and Jemo Island (n = 8). These may be important nesting sites in the Marshall Islands but more surveys throughout the nesting season would be needed. Other areas should also be surveyed to identify potential nesting sites.

5 Tag recoveries

All the tag recoveries associated with the Marshall Islands recorded in TREDIS provides important information on various potentially important nesting and foraging areas in the Pacific.

5.1 Turtles tagged in the Marshall Islands

5.1.1 Local tag recoveries

Two post-nesting green turtles that were initially tagged in Jemo Island and Bikar Atoll were reported as tag recoveries from Jemo and Majuro respectively. Another turtle that was initially tagged in Majuro Island was recaptured in Majuro lagoon.

5.1.2 International tag recoveries

Eight post-nesting green turtles that were initially tagged in Bikar Atoll were reported as tag recoveries from the Federated States of Micronesia (n = 1), Kiribati (n = 1), Papua New Guinea (n = 3)

and Solomon Islands (n = 2). Another post-nesting green turtle that was tagged in Erikub Atoll was encountered twice by a fisherman in the Solomon Islands, releasing it the first time and spearing it the second time it was encountered.

5.2 Turtle migration into the Marshall Islands

One record of a green female that was initially encountered while foraging on Clacks Reef in Queensland, Australia was reported as a tag recovery from Erikub Atoll.

New Caledonia

1 Tag inventory

1.1 Tags distributed by SPREP

Flipper tags were distributed by SPREP to Association Pour la Sauvegarde de la Nature Néocalédonienne (ASNNC), WWF New Caledonia and Service de la Marine Marchande et la pêches Maritimes. Of the 7292 tags that have been recorded as distributed to New Caledonia by SPREP only 2801 (38.4%) are recorded in TREDIS.

1.2 Other tags used in New Caledonia

227 non-SPREP tags were also applied to turtles in New Caledonia and recorded in TREDIS.

1.3 Untagged Turtles

Untagged turtles can also be recorded in TREDIS. TREDIS holds no untagged turtle records for New Caledonia.

2 Species Occurrence by Site

The turtle species in recorded in TREDIS by site for New Caledonia are the green turtle (n = 2315), three loggerhead turtles and one unidentified species. 2275 (98.1%) records of the 2319 records held in TREDIS for New Caledonia are from surveys carried out by the ASNNC on the Huon, Surprise, Fabre and Le Leizour Islands of the D'Entrecasteaux Reef system in the Northern Province.

3 Size Frequency by species

The size frequency of green turtles recorded in TREDIS for French Polynesia (n=1669) shows those 1668 adult sized turtle within the CCL size class range of 85.0 – 129.9cm and one sub-adult sized turtle within the 80.0 – 84.9cm CCL size class range.

4 Nesting Turtles by site

The majority of surveys in New Caledonia have been conducted on the islands on the Entrecasteaux reefs in the Northern Province.

4.1 Green turtle nesting

The total number of green turtles recorded as nesting in TREDIS for New Caledonia is 1884 and 1875 of these records are from the Fabre, Huon, Surprise and Le Leizour Islands of the D'Entrecasteaux Reef system of the Northern Province.

TREDIS also hold 9 records of green turtles nesting at Roche Percee in the Southern Province. The records held in TREDIS for New Caledonia clearly show the islands in the D'Entrecasteaux Reef system to be an important Green turtle nesting area in the Pacific.

Nesting surveys such as those that have been conducted on Fabre, Huon, Surprise and Le Leizour Islands should be expanded to other known nesting sites to identify other important nesting sites in New Caledonia.

4.2 Loggerhead turtle nesting

Only one loggerhead is recorded as nesting on Ilot Gi in the southern Province of New Caledonia. Other work has been conducted on loggerhead turtles but have yet to be included in TREDIS. More information is needed to yield a better understanding of loggerhead turtle populations in New Caledonia.

5 Tag recoveries

5.1 Turtles encountered more than once

TREDS holds two records of post-nesting green turtles that were initially tagged in Queensland, Australia followed by subsequent re-nesting in the same areas during different nesting seasons and then finally being reported as tag recoveries from New Caledonia. New Caledonia may be an important foraging area for nesting Green turtles from this area of Queensland. Another tag recovery is of a green turtle that was initially tagged foraging in Shoalwater Bay, Australia and then later reported as nesting at Surprise Island followed by the last encounter of this turtle at Balabio Island in the Northern Province.

5.1 Turtles tagged in New Caledonia

All of the tag recoveries of turtles tagged in New Caledonia have been of turtles that were initially tagged while on the islands of the D'Entrecasteaux Reef system. Tag recoveries of 11 post-nesting green turtles initially tagged while nesting on Huon Island were reported from Australia (n = 7) and within New Caledonia (n = 4). One green turtle that was tagged while nesting in Fabre Island was re-encountered on Combe Reef in Queensland, Australia. Another green turtle that was tagged on Le Leizour Island was recaptured and killed in Ile de Pines, Southern Province.

5.2 Tag recoveries of turtles tagged outside New Caledonia.

5.2.1 Post-nesting turtles

Tags recoveries of post-nesting female green turtles that initially tagged in Queensland, Australia (n = 26) by the Queensland Turtle Research Project were reported from New Caledonia. Two post-breeding male green turtle that initially captured and tagged while mating in Queensland, Australia were also reported from New Caledonia. Another two post-nesting female that were initially tagged at Scilly Atoll in French Polynesia were reported tag recoveries from New Caledonia.

5.2.2 Post-foraging turtles

Four green turtles that were initially captured on the Great Barrier Reef in Australia, tagged and released were reported from Huon Island in the Northern Province. It is possible that these turtles were foraging on the Great Barrier Reef and are returning to their breeding grounds on the islands of the D'Entrecasteaux Reef.

5.2.3 Unknown species

One unknown turtle species that was tagged in Samoa no record in TREDS but tag was distributed to Samoa) was reported as a tag recovery from New Caledonia. Another unknown species with no initial tagging record in TREDS was also reported from New Caledonia.

Palau

1 Tag inventory

1.1 Tags distributed by SPREP

The inventory of all known flipper tags distributed by SPREP to the Bureau of Marine Resources (BMR) is recorded in TREDIS. Of the 1620 tags distributed to the FSM only 521 (32.1%) have been recorded as been applied to a turtle in TREDIS.

1.2 Other Tags used in the FSM

Flipper tags were also supplied to Palau by other agencies. Six non-SPREP flipper tags were applied to turtles at the Micronesian Mariculture Demonstration Center.

1.3 Untagged turtles

Untagged turtles can also be recorded in TREDIS. One untagged green turtle and one untagged hawksbill turtle are recorded in TREDIS for Palau.

2 Species Occurrence by Site

The most abundant marine turtle species recorded in TREDIS for Palau is the green turtle with 414 records. 33 hawksbill and 2 Olive ridley turtles are also recorded in TREDIS. The high numbers recorded at Helen Island (n = 191), Helen reef (n = 67) and Merir Island (n = 131) are a result of targeted surveys being carried out at these sites.

The records in TREDIS further show that the occurrence of green turtles are more common on in the Southwest islands (Hatohobei and Soronsol States) whilst the hawksbill turtle are more common around the other 16 states to the north of Palau.

3 Size Frequency by species

3.1 Green turtle size frequency

The size frequency graph of green turtles recorded in TREDIS for Palau (n=309) shows nine juveniles within the CCL size range of 30.0 – 64.9 cm, 43 turtles within the sub-adult CCL size range of 65.0 – 84.9cm and 257 adult sized turtles within the CCL size range of 85.0 – 124.9 cm.

3.2 Hawksbill turtle size frequency

The size frequency graph of hawksbill turtles recorded in TREDIS for Palau (n=17) shows 15 juveniles within the 30.0 – 64.5 CCL size range, 1 sub-adult within the 65.0 – 69.9 CCL size class range and one adult sized turtle within the 85.0 – 89.9cm CCL size range.

3.3 Olive Ridley turtle size frequency

Two olive ridley turtles were recorded in TREDIS were within the 50.0 – 69.9 size class intervals.

4 Nesting Turtles by site

4.1 Green turtle nesting

A total of 313 green turtles are recorded in TREDIS as nesting for Palau. 188 green turtles are recorded as nesting on Helen Island and 124 on Merir Island. One nesting green was recorded on Tobi Island in 1992. The high numbers of green recorded at Helen Island, Helen Reef and Merir Island indicate that these may be important nesting sites. Continued surveys in identified nesting areas and the expansion of surveys to identify potential nesting would yield a better picture of nesting populations in Palau.

4.2 Hawksbill turtle nesting

TREDIS hold only two records of hawksbill nesting on Malakal Island in Koror State. There are most probably more hawksbill nesting sites in Palau but more surveys are needed to confirm this.

5 Tag recoveries

5.1 Turtles tagged outside Palau

Tag recoveries of post-nesting female green turtles initially tagged while nesting on Gielop Island, Ulithi Atoll, FSM (n = 4) and one from Oroluk Island, Oroluk Atoll, in the Federated States of Micronesia were reported from Palau.

5.2 Tag recoveries of turtles tagged in Palau

The tag recovery of one hawksbill turtle that was tagged and released from the Micronesian Mariculture Demonstration Center was reported from Zamboanga Del Sur in the Philippines. Two post-nesting hawksbills tagged initially at Malakal Island were reported from Davao Oriental in the Philippines and Weno Island in the FSM respectively. One post-nesting green turtle initially tagged while nesting on Helen was reported as a tag recovery from Likupang, North Sulawesi in Indonesia. Another post-nesting green turtle tagged initially on Merir Island was reported from Yomitami, Okinawa Island in Japan.

Papua New Guinea

1 Tag inventory

1.1 Tags distributed by SPREP

Flipper tags were distributed by SPREP to Department of Conservation and Environment, Conservation International – Milne Bay, the National Fisheries Agency, the Village Development Trust (VDT), Mahonia Na Dari and the Sea Turtle Restoration Project. Of the 3426 tags that have been distributed to various organisations by SPREP only 55 (1.6%) have been recorded in TREDIS for PNG.

1.2 Other tags used in Papua New Guinea

TREDIS also records flipper and passive integrated transponder (PIT) tags supplied to Papua New Guinea by US National Oceanic and Atmospheric Administration (NOAA) and the Queensland Environment Protection Agency. Of the 1297 tags distributed by other agencies only 394 (30.3%) tags are recorded in TREDIS. The complete number of tags distributed to Papua New Guinea by other agencies is not known and only numbers that are recorded in TREDIS are reported on in this report.

1.3 Untagged turtles

Records of untagged turtles can also be recorded in TREDIS. There are no untagged turtle records for Papua New Guinea in TREDIS.

2 Species Occurrence by site

The most abundant species of marine turtle recorded in TREDIS for Papua New Guinea is the green turtle (n = 206) with the majority of these records (n = 181) being from surveys that were carried out on Long Island in 1980, 1981 and 1991. TREDIS holds 68 records of leatherback turtles from the Huon. Two loggerhead turtles, four unidentified turtle species and 12 hawksbill turtles are also recorded.

There is more known data on leatherback turtles from the Morobe Province and as well as green turtle records from Milne Bay Province but these records are not in TREDIS. This data will be incorporated into TREDIS for the next reporting round.

3 Size Frequency by species

3.1 Green Turtle size frequency

The size frequency of green turtle for Papua New Guinea (n=136) shows nine juveniles turtles within the 35.0 – 59.9cm CCL size classes, 1 sub-adult sized turtle within the 70.0 – 74.9cm CCL size class and 126 adult sized turtles within the 90.0 – 114.9cm CCL size class ranges. The majority of turtles recorded are adults but this data is only limited to nesting surveys that were carried out on Long Island, Madang Province in 1980, 1981 and 1991.

3.2 Leatherback turtle size frequency

The size frequency of leatherback turtles recorded in TREDIS for Papua New Guinea shows 71 turtles within the 135.5 – 184.9cm size class ranges. This data is restricted only to nesting females recorded at the Huon Coast. TREDIS hold 71 records of leatherback turtles with CCL measurements. 57 out of the 71 CCL measurement data recorded from the Huon Coast seem to be measured or rounded to nearest 10 centimetres with 14 records being measured to nearest centimetre. It is important to make sure the most accurate CCL measurements are taken in order for this data to provide accurate and useful results. Turtles are usually measured to the nearest decimal point, e.g. 171.4cm. When a measuring tape is not available for measuring CCL then it is advised that CCL measurements not be estimated as this would create inaccuracies in research.

4 Nesting Turtles by site

Although many projects are operational in Papua New Guinea there are limited records of nesting in TREDIS.

4.1 Leatherback turtle nesting

Leatherback turtles were recorded in TREDIS as nesting in the Huon Coast for the 2000 (n=29) and 2002-03 (n=39) nesting seasons.

4.2 Green turtle nesting

TREDIS contains only records of green turtle nesting on Long island in the Madang Province during the 1980-81 (n=88) and 1991-92 (n=91) nesting seasons.

4.3 Hawksbill turtle nesting

TREDIS has one record of a nesting hawksbill at Suau Island, Milne Bay Province that was initially tagged while foraging on the Great Barrier Reef in 1999 well as one record for Wide Bay, East New Britain Province.

5 Tag recoveries

Tag recoveries of turtles from all over the Pacific Islands regions show that Papua New Guinea is an important foraging and nesting area.

5.1 Turtle tagged in Papua New Guinea

Nine of the flipper tag recoveries for green turtles that have been tagged in Papua New Guinea have been made in Papua New Guinea. One international tag recovery of a green turtle that was tagged initially in Papua New Guinea was reported from the Aru Islands in Indonesia. Three leatherback turtles and one unknown species initially tagged in Papua New Guinea were also reported as tag recoveries from Papua New Guinea.

5.2 Turtle migration into Papua New Guinea

Tag recoveries of green turtles from Australia (n=16), Federated States of Micronesia (n=1) and Marshall Islands (n=4) were of turtles that were initially tagged while nesting. Tag recoveries of sub-adult green turtles from French Polynesia (n=2), and Solomon Islands (n=2) were of turtles that initially tagged while foraging. Two nesting hawksbills from Australia and one sub-adult released from captivity in Samoa were reported as tag recoveries from Papua New Guinea. Four loggerhead turtles that were initially tagged while nesting in Queensland, Australia and one unknown species were also reported as tag recoveries.

5.3 Turtle encountered more than once

Tag recoveries of five turtles that have been encountered more than once after they were initially tagged were also reported. All information on tag recoveries of turtle that were initially tagged in Australia were shared with SPREP by the Queensland Research Project.

Samoa

1 Tag inventory

1.1 Tags distributed by SPREP

Flipper tags were distributed by SPREP to the Division of Environment and Conservation (DEC) and the Fisheries Division. Of the 1304 tags distributed to the Division of Environment and Conservation and the Fisheries Division only 246 (18.8%) have been recorded in TREDIS

1.2 Untagged turtles

Untagged turtles can also be recorded in TREDIS. 16 untagged green turtles and 36 untagged hawksbill turtles are recorded for Samoa in TREDIS.

2 Species occurrence by site

TREDIS hold records of 88 hawksbill turtles, 72 green turtles and 2 unidentified species. Turtles reported from the Malua Theological College (n = 38) are turtles that given to the college and kept in the pond. Occasionally, the Division of Environment and Conservation in association with the Theological College tag and release the majority of turtles back to sea.

All of turtles recorded from the Aleipata Islands (n = 35) are turtles that were recorded as part of the nesting surveys. A further two turtles were reported as nesting at Saaga Beach and Lalomanu on Upolu Island. The rest of the turtles (excluding Malua and the nesting turtles) recorded are one-off reports of captured turtles (n = 87) that are tagged and released by DEC and the Fisheries Division.

A dead leatherback turtle was brought to land as by-catch from a longline vessel in the late 1990s but there is not data on this in TREDIS.

3 Size Frequency by species

3.1 Green turtle size frequency

The size frequency for green turtles recorded in TREDIS for Samoa (n=79) shows 67 juveniles within the 25.0 – 64.9cm CCL size class range, 11 sub-adults within the 65.0 – 84.9cm CCL size class range and one adult within the 95.0 – 99.9 CCL size class range.

3.2 Hawksbill turtle size frequency

The size frequency for hawksbill turtles recorded in TREDIS for Samoa (n=56) shows 51 juvenile turtles within the 30.0 – 64.9cm size class range and 5 adult sized turtle within the 70.0 – 84.9 CCL size class range.

4 Nesting Turtles by site

The hawksbill turtle is the only known turtle species to nest in Samoa. All of the turtle nesting recorded has been on the Aleipata Islands and Upolu Island. A total of 36 hawksbill turtles are recorded as nesting for Samoa in TREDIS.

5 Tag recoveries

5.1 Turtles tagged outside Samoa

Two juvenile green turtles that initial tagged and released at Scilly Atoll, French Polynesia when reported from Vaitoomuli village on Savaii Island. One juvenile hawksbill turtle that was initially tagged in American Samoa was reported from Fagaloa Bay on Upolu. All of these turtles were re-tagged in Samoa and released.

5.3 Turtles tagged in Samoa

One hawksbill turtle that was tagged and released from Apia, Upolu Island was reported as a tag recovery from Enang Island, New Ireland Province in Papua New Guinea. Another hawksbill turtle

that was initially tagged and released from the Malua Theological College pond was reported as a tag recovery from Wasaga, Vanua Lava Island in Vanuatu.

Solomon Islands

1 Tag inventory

1.1 Tags distributed by SPREP

Flipper tags were distributed by SPREP to the Department of Forests, Conservation and Environment, Ministry of Fisheries and Marine Resources, Tetepare Descendants Association (TDA), Forum Fisheries Agency (FFA) Observer programme, WWF and TNC. Of the 3045 tags distributed by SPREP only 1016 (33.4%) have been recorded in TREDIS.

1.2 Other tags used in the Solomon Islands

TREDIS also records tags received by the Solomon Islands from other agencies as well as tags from other tagging programs that are recorded in TREDIS as tag recoveries. 93 non-SPREP tags have been recorded as being applied to turtles.

1.3 Untagged turtle

Untagged turtles can also be recorded in TREDIS. One green turtle and two hawksbill turtles are recorded as untagged turtles in TREDIS for the Solomon Islands.

2 Species occurrence by site

A total of 822 turtles are recorded in TREDIS for the Solomon Islands. The species recorded are Green turtles (n = 426), hawksbill turtles (n = 256), leatherback turtles (n = 132), three loggerhead turtles, three Olive Ridley turtles and two unidentified species. The numbers of species recorded in TREDIS are by island in areas that have either been studied during fieldworks or random encounters of individual turtles.

High numbers of turtles recorded in Wagina, Kerehikapa, Santa Isabel, Obeani and Tetepare are a result of surveys that have been conducted in these areas. The numbers of turtles and species recorded in TREDIS for the Solomon Islands indicates that this area may be an important foraging and breeding ground for the five species of turtles recorded but more data is needed in TREDIS to confirm this.

3 Size Frequency by species

3.1 Leatherback turtle size frequency

The size frequency of leatherback turtles recorded in TREDIS for the Solomon Islands shows 131 adults within the 115.0 – 184.9cm CCL size class ranges. Most of the leatherbacks turtles have been recorded on Santa Isabel and Tetepare Islands.

3.2 Hawksbill turtle size frequency

The size frequency of hawksbill turtles recorded in TREDIS for the Solomon Islands (n=273) shows 83 juveniles within the 10.0 – 64.9cm CCL size classes, 34 sub-adult sized turtles within the 65.0 – 79.9 size class ranges and 156 adult sized turtles within the 80.0 – 99.9cm CCL size class ranges.

3.3 Green turtle size frequency

The size frequency of green turtles recorded in TREDIS for Solomon Islands (n=410) show 279 juvenile turtles within the 35.0 – 64.9cm CCL size classes, 87 sub-adult turtles within the 65.0 – 84.9cm CCL size class ranges and 44 adult sized turtles within the 85.0 – 114.9cm size class ranges.

3.4 Loggerhead turtle size frequency

One loggerhead turtle record in TREDIS had a CCL measurement within the 85.0 – 89.9 size class range.

3.5 Olive Ridley turtle size frequency

Two olive ridley turtle records in TREDIS had CCL measurements within the 65.0 – 74.9cm CCL size class ranges.

4 Nesting Turtles by site

4.1 Leatherback turtle

Records in TREDIS show the leatherback turtle to be nesting on Santa Isabel Island (n = 69), Makira (n = 1), Rendova (n=2) and Tetepare Islands (n=20). A total of 92 leatherback turtles were recorded as nesting.

4.2 Hawksbill Turtle nesting

A total of 171 hawksbill turtles are recorded in TREDIS as nesting in the Solomon Islands. The most surveyed area in the Solomon Islands for the hawksbill turtle are the islands of the Arnavons Group but not all of this data has been recorded in TREDIS. Other island groups such the Obeani and the Santa Cruz Island Groups show hawksbill turtle nesting but more surveys would be required to confirm this.

Hawksbill nesting recorded in TREDIS include Arnavons Islands (148), Wagina Island (1), Kia, Santa Isabel Island (n = 1), Obeani Islands (n = 18) and Nelua, Santa Cruz Islands (n = 1)

4.3 Green Turtle nesting

A total of 13 green turtles are recorded as nesting in TREDIS for the Solomon Islands. Green turtle nesting was recorded on Kerehikapa Island (n = 7), Tetepare Island (n = 5) and Obeani Island (n = 1). There is a paucity of data on green turtle nesting and subsequently, more targeted surveys in identified nesting areas are required.

4.4 Loggerhead turtle nesting

A mating pair of Loggerhead turtles was identified in off North Honiara (McKeown, 1977). It is possible that there may be more loggerhead turtle nesting in the Solomon Islands but more surveys may be needed.

5 Tag recoveries

5.1 Turtle migration into the Solomon Islands

Tag recoveries recorded in TREDIS for turtles migrating into the Solomon Islands are of three green turtles and three hawksbill turtles. Tag recoveries from green turtles are of two adult females that initially tagged while nesting on Bikar Atoll, Marshall Islands and one adult female that was initially tagged while nesting on Howick Island of the Howick Island Group in Australia.

Tag recoveries of the hawksbill turtles are of turtles that initially tagged in foraging grounds on Sakeman, Clack and Morris Island Reefs in Australia and were later reported as tag recoveries from the Solomon Islands. Turtles tagged in Australia are turtles that have been tagged as part of the Queensland Turtle Research Project

5.3 Turtles tagged in the Solomon Islands

5.3.1 International tag recoveries

One adult female hawksbill turtle that was initially tagged while nesting on Kerehikapa Island in the Arnavons Group was reported as a tag recovery from Fisherman's Island in the Central Province of Papua New Guinea. Two green turtles that were tagged while foraging at Kia and Sire Bay in the Isabel Province were reported as tag recoveries from Papua New Guinea in the Carteret's Island, Bougainville Province, and Lababia, Morobe Province respectively.

5.3.2 Local tag recoveries

Local tag recoveries were reported of 12 hawksbill turtles (10 nesting females and two foraging turtles) that were initially tagged in the Solomon Islands. Three green turtles initially tagged at Santa Isabel and Wagina were reported as tag recoveries from the same areas.

A further two unidentified species were also reported as tag recoveries from Wagina and New Georgia Islands. These two tag recoveries have no initial tagging information in TREDIS but are known to be local tags recoveries as tags numbers are recorded in the tag inventory as being sent to the Solomon Islands.

5.4 Turtles encountered more than once

TREDIS holds one record of a female green turtle that was tagged while nesting in the Marshall Islands and encountered twice off Nupani Island in the Tuamotu Province.

Tonga

1 Tag inventory

1.1 Tags distributed by SPREP

The tag inventory records all details of tags distributed by SPREP to the Ministry of Fisheries and Whale Watch Vavau Limited. Of the 450 known tag series recorded in the inventory only 11 (2.4%) have been recorded in TREDIS as being used for tagging.

1.2 Other tags used in Tonga.

Only one non SPREP tag is recorded in TREDIS as being used in Tonga but the source of this tag is unknown.

1.3 Untagged turtles

Untagged turtles can also be recorded in TREDIS. TREDIS holds no untagged turtle records for Tonga.

2 Species occurrence by site

TREDIS holds four hawksbill turtles found on Tongatapu. Green turtle were documented in Tongatapu Island (n = 2), Vavau Island (n = 1), Tonga (n = 1), Lifuka Island (n = 1) and Haapai Island (n = 1).

3 Size Frequency by species

TREDIS holds only records for two juvenile hawksbill turtles and one juvenile green turtle with CCL measurements for Tonga. The two hawksbill turtles are within the 30.0 – 49.9cm CCL size class and the juvenile green turtle is within the 40.0 – 44.9 CCL size class.

4 Nesting Turtles by sites

TREDIS holds no records of turtles nesting in Tonga. TREDIS contains only 12 records for Tonga.

5 Tag recoveries

5.1 Turtles encountered more than once.

TREDIS holds one record of a nesting green turtle tagged initially in Scilly Atoll that migrated to Tonga and later returning to French Polynesia.

5.3 Turtles tagged outside Tonga.

All of the tag recoveries of turtles migrating into Tonga are of turtles that were initially tagged in French Polynesia. Three juvenile green turtles tagged and released from Tahaa, French Polynesia were encountered in Tongatapu, Lifuka and Hihifo Islands respectively. A green female turtle that was tagged and released from Scilly Atoll, French Polynesia was encountered in Vavau Island, Tonga. Another tag recovery of a juvenile turtle tagged in French Polynesia was reported from Tongatapu Island, Tonga

5.4 Turtle tagged in Tonga.

One tag recovery of a green turtle initially tagged in Tonga was reported from Ono-I-Lau Island in Fiji.

Tuvalu

1 Tag inventory

1.1 Tags distributed by SPREP

TREDS holds an inventory of tags distributed to the Fisheries Department, the Department of Environment and TANGO by SPREP. Of the 750 tags distributed to Tuvalu only 60 (8 %) have been recorded in TREDS.

1.2 Untagged turtles

Records of untagged turtles can also be entered in TREDS. TREDS holds records for one hawksbill turtle and one green turtle.

2 Species occurrence by site

The most abundant species recorded in TREDS for Tuvalu is the green turtle with 35 records followed by the hawksbill turtle with only one record at Funafuti Islet. Green turtles were recorded at Fongafale (n=4), Fuafatu (n=5), Fualafeke (n=2), Funafala (n=14), Funafuti (n = 2), Matafenua (n = 1), Nukufetau (n = 1), Papaelise (n = 1), Te Gasu (n = 1), Tepuka Lagoon (n = 1), Tuvalu (n = 2) and Vaasafua Reef (n = 1).

3 Size Frequency by species

3.1 Green turtle size frequency

The size frequency of green turtles recorded in TREDS for Tuvalu (n=32) shows 29 juvenile turtles within the 35.0 – 59.9cm CCL size class ranges, one sub-adult turtle within the 65.0 – 69.9cm size class and 2 adult sized turtle within the 90.0 – 104.9 size classes.

3.2 Hawksbill turtle

TREDS holds only one record of a hawksbill turtle with CCL measurement.

4 Nesting Turtles by site

There are no records in TREDS of turtles nesting in Tuvalu, but more surveys are needed.

5 Tag recoveries

5.1 Turtles tagged outside Tuvalu

Only 2 international tag recoveries are recorded for Tuvalu and these are post-nesting adult green turtles that were initially tagged at Scilly Atoll in French Polynesia and later reported from Tuvalu.

5.2 Turtles tagged in Tuvalu

A local tag recovery was of a hawksbill turtle but there is no initial tagging information for this turtle.

Vanuatu

1 Tag inventory

Of the tags 300 tags that were recorded distributed SPREP to the Environment Unit, 13 tags records (4.3%) appear in TREDIS and 315 tags distributed to the Fisheries Department 153 records (48.6%). From the 9048 tags distributed to WSB 2226 tags records (24.8%) appear in TREDIS. Of the 500 tags distributed to Tranquility Resort only 49 records (9.8%) appear in TREDIS. This information was collated based on information available at SPREP and from WSB since the initial implementation of TREDIS in March 2004. Overall, of the 9663 tags distributed only 2392 (24.7%) have been recorded in TREDIS.

2 Size Frequency by species

For hawksbill turtles recorded in TREDIS, CCL size range 35 - 39.9cm shows the highest numbers for this species 167 (27.7%) and 0.0-4.9cm having the lowest numbers of 1 (0.2%). For green turtles the CCL size range with the highest frequency is 45.0 – 49.9cm with 70 (15.7%) individuals recorded. All recorded leatherback turtles are adults with CCL size ranging from 105.0 – 199.9cm. Four of the five loggerhead turtles recorded in TREDIS had CCL size ranging from 40.0 – 59.9cm and 1 within the 100.0 – 104.9cm range. Three olive ridley turtles were recorded within the CCL size range of 45.0 – 54.9cm.

The most common species recorded for Vanuatu is the Hawksbill turtle (*Eretmochelys imbricata*) 56.6% followed by green turtles (*Chelonia mydas*) 41.8%, leatherback (*Dermochelys coriacea*) 0.8%, loggerhead (*Caretta caretta*) 0.8% and Olive Ridley (*Lepidochelys olivacea*) 0.3% respectively (refer to figure 1). When comparing the data recorded in TREDIS to surveys carried out at nesting beaches (refer to table 2) it is quite possible that there are gaps in data in TREDIS as there are no records of leatherback turtles tagged at Big Bay - Espiritu Santo, Maranata, Toman - Malekula and Votlo - Epi (2007/08).

3 Nesting Turtles by sites

TREDIS records show the leatherback turtle nesting Votlo (n = 8) and Port Qumie (n = 1) on Epi Island, and Port Olry (n = 1) on Espiritu Santo. Only 1 record of nesting loggerhead was found on the island of Loh.

The hawksbill turtle is recorded in TREDIS as nesting on the islands of Efate (n = 1), Epi (n = 2), Espiritu Santo (n = 92), Malekula (n = 61), Moso (n = 49) and Tegua (n = 1) with Moso showing the highest numbers possibly due to effort put into surveys at Tasiriki, Moso (n = 49) and Bamboo Bay, Epi (n = 54) during the 2006/07 and 2007/08 nesting seasons.

Green turtles have been recorded as nesting on the islands of Epi (n = 16), Espiritu Santo (n = 3), Malekula (n = 73), Moso (n = 2), Motalava (n = 1), Pentecost (n = 1) and Tegua (n = 91) with the highest numbers recorded on Malekula due to surveys carried out at the Bamboo Bay area (n = 52) in the 2004/2005 and 2006/2007 nesting seasons.

4 Tag recoveries

4.1 Turtles tagged in Vanuatu

TREDIS shows 14 records of turtles tagged in Vanuatu were reported as tag recoveries from within Vanuatu. Out of these five records have no initial tagging details, and could only be traced as being used in Vanuatu through the TREDIS Tag inventory. SPREP has not yet received any tag recoveries of turtles tagged in Vanuatu outside Vanuatu waters.

4.2 Turtles tagged in elsewhere and recaptured in Vanuatu

Three green turtle tag recoveries were from turtles that were reported as nesting and tagged in SGBR - Australia, French Polynesia and American Samoa. The two hawksbill turtle tag recoveries were turtles that were tagged and released as subadults in Australia and Samoa.

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