



A brief report on the 2014/15 monitoring of marine turtles on the Sao Sebastiao peninsula, Mozambique

S. Kyle. & G. van Wyk, May 2015.



**Success: A loggerhead turtle laying her eggs on the Sao Sebastiao peninsula, during the
2014 2015 nesting season**

OFFICIAL SPONSOR



Executive summary

This last season saw a substantial increase in the amount of turtle activity, confirmation that green turtles are nesting on Sanctuary and no reports of turtle poaching or nest robbing. Sanctuary turtle monitoring benefitted the local community, through monitor salaries, while the community responded with less disturbance of turtles. Since the first year of real protection, numbers of turtle nests have increased markedly and last year's total was the highest yet recorded. The around 25 kilometres of shore patrolled by Sanctuary is effectively the only area where it is safe for turtles to nest for many hundreds of kilometres north and south of Sanctuary. The Sanctuary turtle team was represented at an international turtle workshop, in Ponta D'Oro in November 2014, where the importance of its work was specifically highlighted and acknowledged for the progress it has made in turtle conservation in Mozambique. Sanctuary monitoring is now fully integrated the Mozambican and international turtle monitoring network.

Introduction

Marine turtles are a charismatic and important component of tropical marine ecosystems and several species are routinely seen when snorkeling or boating in Sanctuary waters. Many of the world's remaining important marine turtle breeding areas are on islands but one of the few mainland areas where turtles used to breed in large numbers was on the east coast of the African continent. Unfortunately there are now few places left on this shore where large numbers of turtles breed. It is only in the extreme north of the South Africa coastline where this declining trend has been reversed following rigorous protection for over fifty years.

All marine turtles are threatened or endangered and the leatherback turtle, often seen in Sanctuary waters, is currently classified as critically endangered.

Up to five species of marine turtle are reported to have bred on the shores of Mozambique (Louro et al, 2006, Fernandez et al, 2014). In the past, however, information was scanty, often only colloquial and sometimes misleading. In recent years more attention has been paid to the situation and slowly better information and more accurate data have been obtained (Louro et al, 2012, Pereira et al, 2009, Videira et al, 2010). Efforts have been made to collate and organize the available historical data and combine this with current information (Louro et al, 2012, Pereira et al, 2009, & Videira et al 2010, Louro et al, 2012, Fernandez et al, 2014) and this is leading to a much better understanding of the status of marine turtles in Mozambique.

Various turtle monitoring schemes have been carried out along the Mozambican shoreline in the past but methods of data collection and levels of accuracy were dissimilar and often incompatible. This resulted in a confused situation where turtle breeding was monitored in different ways making simple collation or comparison of data difficult and misleading. In November 2010 a turtle Workshop was held in Maputo (Pereira & Videira, 2010) to address this situation and attempt to standardize methods of data collection. This resulted in a more consistent approach to turtle monitoring that enabled the compilation of a useful annual National Mozambican Turtle Status Report.

For the last five years organized nesting turtle protection and monitoring has been carried out on the eastern shore of Sanctuary by the management team. This brief report serves to present the information collected in the Sao Sebastiao area, strongly assisted by financial help from the Dugong Trust, during the 2014/2015 season.

Methods

The Sao Sebastiao peninsula is situated about twenty kilometers directly south of the southernmost island of the Bazaruto Archipelago and the Bazaruto Archipelago National Park. The region was proclaimed a conservation area on 17 October 2000 under authorization number 4 of 2000 by the government of Mozambique and later on declared a Fully Protected Area. The reserve area that is managed by Santuario Bravio de Vilanculos Lda, or commonly known as The Sanctuary, has a management structure that actively carries out field management of land and marine areas.

Basic, but erratic, turtle monitoring and protection has been carried out for several years but in the earlier years data was scanty and supervision of the monitoring teams was challenging. In the last five years serious attempts have been made to improve both the protection and monitoring. Most Sanctuary turtle breeding is thought to take place on the beaches of the eastern shore of the peninsula and the area monitored last season stretched from about five kilometres south of "Lighthouse" northwards for about 20 kilometers up the shore to the end of the sand spit (Figure 1).

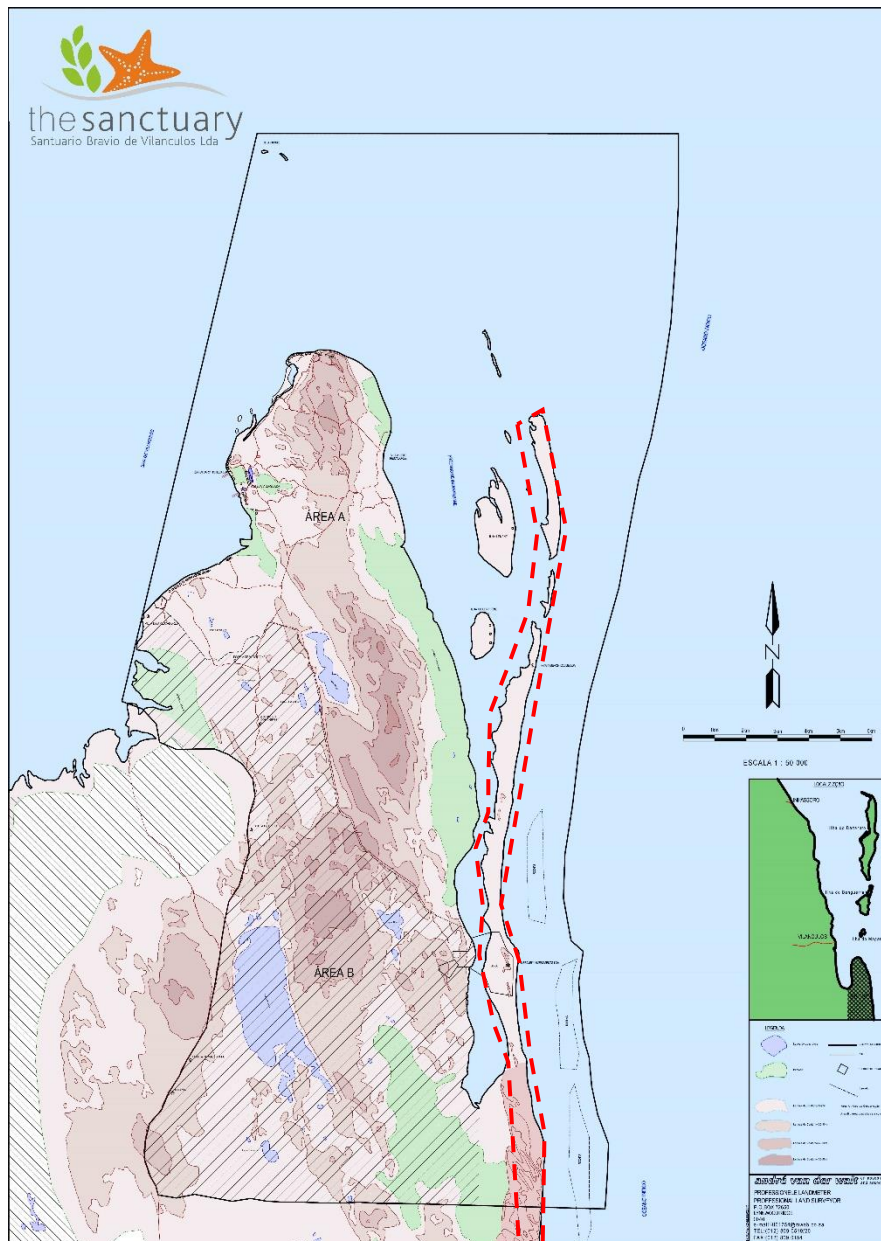


Figure 1. The Sao Sebastiao peninsula showing the area patrolled during marine turtle monitoring (inside the dashed red line) during the 2014/2015 season.

This last season six local residents (five in Photo1a) were selected, trained, equipped and stationed, three at Nyati Beach Lodge and three at Lighthouse, to protect and monitor the study area during the peak period of turtle breeding. They were trained in turtle recognition and the basics of measuring (Photo 1b) and then deployed to protect and monitor the nesting turtles from 9 October 2014 to 15 February 2015.



Photograph 1. The 2014/15 Sao Sebastiao monitors, Aurélio Camba, José Timbe, Jeremias Maswanganhe, Afonso Baloi, Lampião Banze and José Vilanculo (a) and (b) the Sanctuary team measuring a loggerhead turtle.

The Turtle Monitors were issued with protective clothing, data sheets, measuring tapes and digital cameras. They walked their allocated areas nightly and identified and noted all turtles encountered and record all turtle tracks seen. They were not required to tag turtles.

Towards the end of the season Monitors checked for hatching/hatched nests and, when it had been established that the nests had hatched successfully, they were dug up to investigate the hatching success rate (Photos 2 & 3).



Photograph 2. A hatched loggerhead nest excavated by monitors the following morning to check on hatching success.



Photograph 3. Sanctuary hatched loggerhead turtles heading for the ocean during this past season.

Results.

A total of 23 turtle tracks were encountered by the monitoring team during the latest survey period (Table 1), substantially above the 7 recorded last season. In terms of where the turtles are emerging, each track is accurately recorded using a hand held GPS and location results are presented in Tables 1 & 2. The turtles emerged over the whole of the survey area but were concentrated in two regions, in the south around Lighthouse and in the north around Nyati Lodge (Tables 1 & 2). Usually only turtle tracks were found but, on two occasions last season, the turtles themselves were seen by the monitors.

Most turtles (52.2%) were recorded in November this year while in earlier years the peak was a little later (Table 2).

Table 1. Information on turtle breeding activity on Sanctuary during the 2014/2015 season including the date of sighting, locality recorded, if it was a turtle (T) or spoor (S) sighting, the measurement of its tracks (cm) and whether or not it nested (Y= nested, N = no nest)

No.	Date	Zone	S or T	CM	Nest (Y/N)
1	23/11/2014	Lighthouse	S	69	Yes
2	24/11/2014	Lighthouse	S	82	Yes
3	09/12/2014	Lighthouse	S & T	66	Yes
4	05/01/2015	Lighthouse	S	65	Yes
5	15/01/2015	Lighthouse	S	98	Yes
6	29/01/2015	Lighthouse	S	1,037	Yes
7	22/12/2014	Pescada	S	80	Yes
8	24/12/2014	Pescada	S	90	Yes
9	04/01/2015	Pescada	S	83	Yes
10	27/01/2015	Pescada	S	1,206	Yes
11	02/11/2014	Nyati	S	97	Yes
12	03/11/2014	Nyati	S	33	No
13	04/11/2014	Nyati	S	78	Yes
14	07/11/2014	Nyati	S & T	100	Yes
15	14/11/2014	Nyati	S	1,470	Yes
16	17/11/2014	Nyati	S	88	Yes
17	19/11/2014	Nyati	S	1,450	Yes
18	22/11/2014	Nyati	S	1,670	Yes
19	22/11/2014	Nyati	S	72	No
20	24/11/2014	Nyati	S	1,630	Yes
21	17/12/2014	Nyati	S	80	Yes
22	13/01/2015	Nyati	S	75	Yes
23	02/02/2015	Nyati	S	97	Yes

Table 2. Information on turtle breeding activity on Sanctuary during the last four seasons presenting the % emergence by month, total emergences and % by locality.

Category	2011/2012	2012/2013	2013/2014	2014/2015
October	28.6	No monitoring	0	0
November	7.1	44.4	14.3	52.2
December	42.9	55.6	57.1	17.4
January	21.4	0	14.3	26.1
Feb & March	0	0	14.3	4.3
Total tracks/turtles	14	18	7	23
Nyati	35.7	50	42.8	26.1
Pescada	7.1	11.1	14.3	17.4
Lighthouse	57.1	38.9	42.8	56.5

The sizes of tracks measured in the last season (Table 1 & Figure 2) varied greatly, from 33 cm to almost 1.7 metres with no really clear pattern. Several photographs have been taken of Sanctuary nesting turtles and, so far, all have been loggerhead turtles (*Caretta caretta*).

If information on all the turtle tracks measured in the last five years are collated (Figure 3) there appear to be three groupings. Olive ridley turtles (*Lepidochelys olivacea*) are smaller than loggerheads and there have previously been unconfirmed reports of this species nesting on these beaches. Leatherback turtles (*Dermochelys coriacea*), on the other hand are significantly larger than loggerheads and may be responsible for the larger records. Although we have again confirmed the nesting of loggerhead turtles on Sanctuary there is still only circumstantial evidence of leatherback and olive ridley turtles nesting on Sanctuary beaches.

This year, however, photographs of one set of tracks aroused interest and the photo was sent to Dr. George Hughes, the world renowned turtle expert. He identified the animal making the tracks as having been a green turtle (*Chelonia mydas*), due to distinctive flipper markings. The results of the monitoring this year are thus one green turtle track, at least four Loggerhead turtle tracks (identified as the hatchlings were photographed) and 17 other turtle tracks most of which were probably loggerheads.

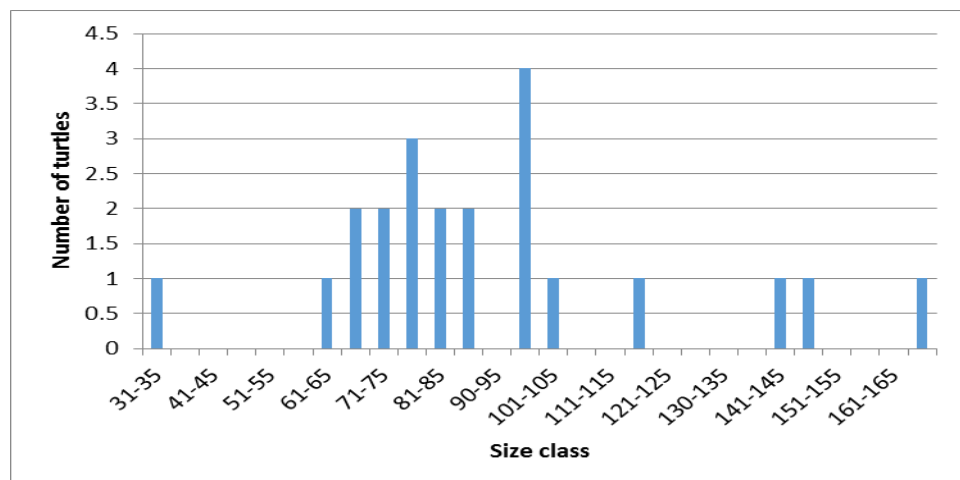


Figure 2. Length frequency analysis of turtle nesting tracks found during the 2014/2015 nesting season on the Sao Sebastiao peninsula.

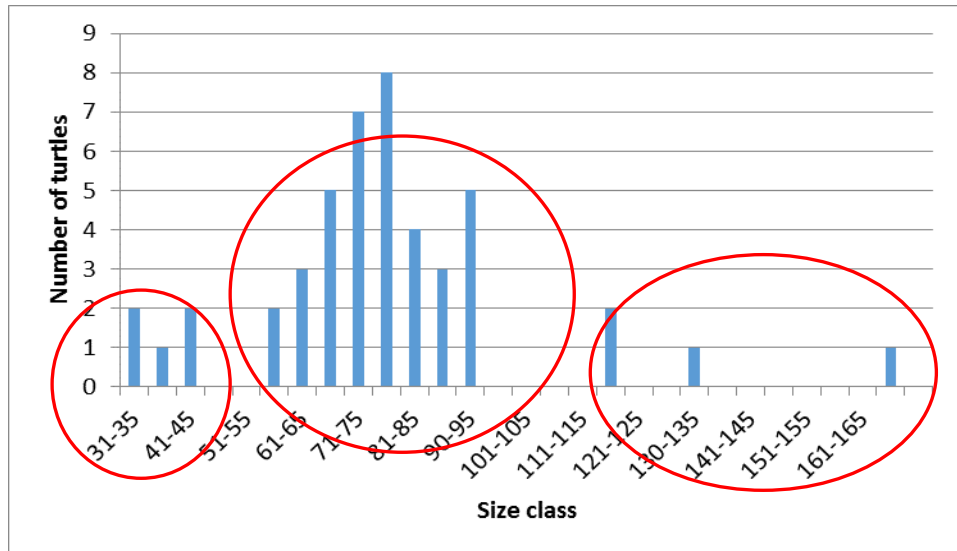


Figure 3. Collated length frequency analysis of turtle nesting tracks found during the 2010/2011, 2011/2012, 2012/2013, 2013/2014 & 2014/2015 nesting seasons on the Sao Sebastiao peninsula showing three apparent size groupings (47 turtle tracks in total).

In the last two seasons no reports have been received of turtles being killed. Turtles will be caught incidentally in gill and seine nets and inevitably some will die in the process. It is clear, however, that in Sanctuary everyone knows that they should not kill turtles and they seem fully aware that if they do kill one there is a good chance of them being reported and prosecuted. This is in stark contrast to much of the rest of the Mozambican coastline.

Bangwe Island is a “Marine Turtle Sanctuary” but very little recent evidence of turtles breeding had been found and it was assumed that there was too much disturbance for them to breed successfully on the island. In April 2013, however, a Sanctuary private site owner, found what he thought were turtle egg shells washed out from the sand on Bangwe. He photographed them (Photograph 4) and sent them in for identification. The eggs were confirmed as marine turtle, most probably loggerhead, and they appear to have hatched. There is thus confirmation that at least one turtle bred successfully on Bangwe in the 2012/2013 season. Sanctuary management now monitors the situation closely but no evidence of breeding activity was recorded this year.



Photograph 4. Hatched marine turtle eggs collected last season on Bangwe Island by a Lodge owner.

A turtle that seemed to be semi resident around the jetty in front of site 7 (Photograph 5) was identified as a “rare and endangered” hawksbill turtle. It has also been reported that there is a resident green turtle at the jetty of Linene 2.



Photograph 5. A hawksbill turtle at the artificial reef near the jetty in front of Lodge Site 7.

Leatherback turtles, which are currently listed internationally as “critically endangered”, are routinely seen in the ocean between Lighthouse and Nyati. It thus seems that five species of marine turtle are to be found in Sanctuary waters where, due to Sanctuary management, they receive a much greater degree of protection than in the surrounding areas.

The total number of turtle tracks recorded in the last five years (Figure 4) show a marked overall increase in numbers. As loggerhead turtles only mature at about 30 years of age it is clear that this apparent increase is not due to simple protection, allowing greater hatchling survival, as this will only be evident in 30 years. It may well be, however, that lower disturbance levels are resulting in turtles gravitating towards Sanctuary where they are better protected.

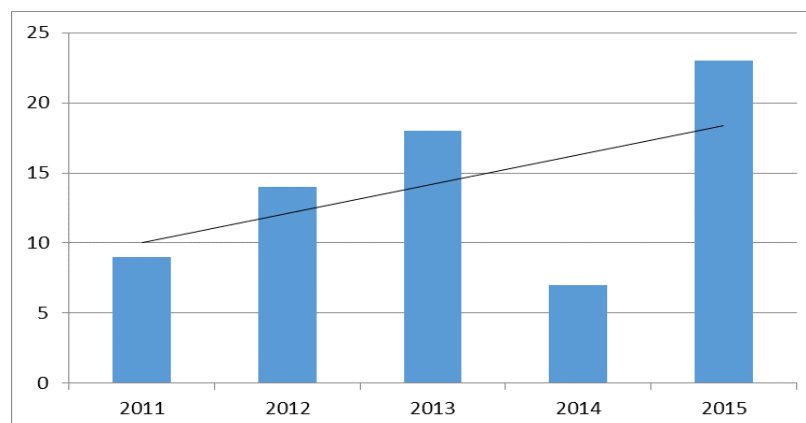


Figure 4. A graph showing the total numbers of turtle tracks recorded on the Sao Sebastiao sand spit from 2011 to 2015.

Discussion

Monitoring of marine turtles on Sanctuary has recorded some important achievements to date. It has shown that:

- at least five species of marine turtle are to be found regularly in Sanctuary waters
- at least two and possibly up to four species of marine turtle nest on Sanctuary
- marine turtles nest on Sanctuary beaches each year and most hatch successfully
- current protection seems adequate to prevent turtle poaching on the beach and nest robbing
- marine turtle monitoring/protection is benefiting the community through Monitor wages and skills development
- Sanctuary is capable of running a successful monitoring scheme
- marine turtles are still under severe pressure in the entire region

The presence of monitors along the study area during peak nesting time appears to have prevented the killing of any turtles, or the robbing of nests, on Sanctuary beaches.

Due to this project there is now a significantly sized area, outside the far south of Mozambique, where marine turtles are monitored and given a substantial degree of protection. It is unknown how many turtles may be trying to nest north and south of the monitored area but it would appear that this is not just an area where turtles occasionally try and lay but possibly a relic or even core area for turtle breeding in the region.

It has also become apparent that the marine area around the turtle monitoring zone contains numbers of leatherback turtles for much of the year. This may be associated with a localised “upwelling” where nutrients from deeper waters are brought to the surface by water movement. This, in turn, results in increased plankton densities and jellyfish numbers that can attract and sustain numbers of large animals that feed on these concentrations. Whale sharks, which are mostly plankton feeders, are reported to be present in this area in good numbers throughout the year and the jellyfish are a prime food for leatherback turtles.

Green turtles are probably the most common turtle species seen by divers in this area. In 2012 Sanctuary staff found a green turtle on the beach (photo 6). It is not clear what this animal was doing as it was immature, and thus not breeding, and it was in daylight and turtles rarely come onto the shore in daylight unless they are seriously injured. This animal seemed healthy and was returned to the water.



Photo 6. An immature green turtle encountered and measured on the beach by Sanctuary Monitors in 2012.

Turtle nesting in this area is seen by Sanctuary as an important aspect of conservation and their management of the region. The core area monitored is fairly remote with few local residents nearby and relatively little disturbance. It is probable that in the past the area was severely impacted by people killing turtles and digging up nests. Almost every old homestead in the area has pieces of turtle carapace in their middens. Changed conditions and improved management of the area, however, has resulted in a fairly extensive area where turtles are relatively safe to nest.

Sadly, in the very recent past, the Mozambican coast has been the scene of large scale killing of marine turtles with several thousand estimated to have been killed annually in recent years. Recently several monitoring programmes in Mozambique, including one on Bazarutto, have had to curtail activities for various reasons rendering that of Sanctuary of even greater importance.

National turtle cooperation and networking. Sanctuary has been and will continue to work closely with other Mozambican government and NGO turtle interests. A Sanctuary representative attends the annual Mozambican Government pre season turtle monitoring meeting in Ponta d'Oro and also the one in South Africa.

International turtle cooperation and networking.

In November 2014 an international Turtle Workshop (Photo 7) was held at Ponta do Ouro to acknowledge progress made in recent years with turtle monitoring and protection in the region. Sanctuary was represented, by the Chairman of the Conservation Committee, who gave a presentation on the work on Sanctuary. The organisers of the workshop acknowledged the importance of Sanctuary monitoring and protection and offered assistance and support for the future.



Photo 7. Attendees at the November 2014 International Marine Turtle workshop at Ponta d' Oro, Sanctuary representative on right of front row of photo and George Hughes third from left in the back row.

Future monitoring

The managers of The Sanctuary propose to repeat the turtle monitoring again this coming season. This next season the target period for monitoring will be from mid-October till mid-March. The aim is to photograph each animal, for positive identification, and all tracks will be counted, measured, photographed and localities recorded.

Funding

Sanctuary has been extremely fortunate in the last few years in that the Dugong Trust has covered most of our operating costs for turtle monitoring and protection. Sanctuary has not yet secured external funds for next season to cover costs for this successful, exciting and important project.

Concluding remarks

It is clear that the shores on the east of Sanctuary, and Bangwe Island, are suitable for several marine turtle species to breed and that at least a few individuals do so each year. Numbers breeding have probably declined markedly in the last few decades due to disturbance, killings and

nest robbing by man. The reduction in these factors will probably/hopefully result in numbers of turtles increasing.

The present monitoring showed that several turtle nests hatched successfully (Photo 8) this season and the future of marine turtles on Sanctuary could be very bright. Sanctuary can be proud of what has been achieved so far.



Photo 8. Freshly hatched Loggerhead turtles heading for the ocean.

The identification, protection and monitoring of a substantial new marine turtle breeding area on the mainland of Africa would be a significant achievement in worldwide marine turtle conservation. It will also be a valuable conservation and tourism asset to Sanctuary and contribute towards the conservation of these charismatic and endangered species.

Turtles have proved to be an extremely lucrative drawcard for tourism in many parts of the world where they generate substantial revenue and create employment for local people. While current Sanctuary monitoring is modest, and numbers of turtles are not great, the future seems full of promise.

Acknowledgements: Thanks are due to:

1. The **Dugong Trust** for essential financial support for the monitoring and protection programme
2. **Sanctuary Owners** and visitors for reporting turtle incidents to Management
3. **Community members** employed by Sanctuary to carry out the programme
4. **Community leaders** for support with the turtle killing incidents
5. **Dr George Hughes** for general support, insights and help with identifying turtles.

References

Fernandes, R S, J Williams, C M M Louro & M A M Pereira (2014). Monitoring, tagging and conservation of marine turtles in Mozambique: annual report 2013/14. 6 pp. Maputo, CTV.

Louro, C.M.M., Videira, E.J.S., Pereira, M. & Fernandes, R. 2012. Monitoring, tagging & conservation of Marine Turtles in Mozambique: Annual report 2012/12.

Louro, C.M.M., Pereira, M.A.M., & da Costa, A.C.D. 2006. Report on the conservation status of Marine Turtles in Mozambique. AICM/GTT

Pereira, A. M., Videira, E.J. S., & Narane, D. A. 2009 Monitoring, tagging and conservation of marine turtles in Mozambique 2008/9 Annual report. AICM/GTT

Pereira, M.A.M., & Videira, E.J.S. 2010. Report on the second workshop on marine turtle conservation in Mozambique, 22 to 23 November 2010. AICM report.

Videira, E.J. S., Pereira, A. M., Narane, D. A. & C.M.M. Louro. 2010 Monitoring, tagging and conservation of marine turtles in Mozambique 2009/10 Annual report. AICM/GTT