

Maldives Sharkwatch Report

2011-2012



Grey reef shark © Jason Isley Scubazoo



Maldives Sharkwatch Report for 2011 - 2012

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Summary

- The aim of Sharkwatch is to collect baseline data on the distribution and abundance of reef sharks throughout the Maldives and to monitor changes in populations following introduction of the reef shark fishing ban on 01 March 2009.
- Over the period July 2009 to June 2012, “Sharkwatch” survey have been carried out by dive schools at resorts in Haa Alifu Atoll, Noonu Atoll, Baa Atoll, Lhaviyani Atoll, North and South Male’ Atoll, Rasdhoo Atoll, North and South Ari Atoll, Dhaalu Atoll and Laamu Atoll. Surveys have also been conducted by Lazy Gecko, an individual Dive centre based in N. Velidhoo.
- This report covers the third year of the programme, from July 2011 to June 2012, when a total of 2,951 Sharkwatch surveys were carried out at 227 sites.
- A total of 6,329 sharks were recorded during July 2011 – June 2012. The most frequently sighted species during this 12 month period were grey reef sharks, closely followed by white tip reef sharks.
- Sharks appear to be relatively widely distributed in the Maldives, occurring at 79% of the sites surveyed in 2009-2010 and 85% of the sites surveyed in 2010-2011. This abundance however decreased to 68% during the period of 2011-2012, which is a possibly due to differences in the sites being surveyed.
- On average 2.03 sharks were recorded per survey over the period July 2010- June 2011 and 2.18 over the period July 2009 – June 2010. An average of 2.14 sharks were recorded for the current survey period.
- Seasonal trends in shark sightings are difficult to establish due to reasons such as short survey time and different survey sites. This emphasizes the importance of continued monitoring of selected sites to assess changes to population and establish seasonal trends. It also reinforces the importance of participation by more resorts/dive centres, so as to enable the monitoring of a greater number of sites and increased survey effort.

Introduction

The biology of sharks, with slow growth, late maturity and low fecundity makes sharks very vulnerable to exploitation. Additionally, sharks play a key role in their ecosystem and are top predators in the marine food chain. Their biology and importance in the ecosystem makes it clearly evident that sharks should be conserved. Sharks have been heavily exploited in the Maldives, especially for their shark liver oil and fins. As a result of intense exploitation shark populations in Maldivian waters decreased over time, which led to legislation being implemented over a number of years in order to manage the fishery and conserve the resource. However, since initial measures to conserve the resource failed to serve the purpose, a fishery ban was implemented in 2009 for the reef shark fishery followed by a total ban on shark fishing within Maldivian waters. Ushan and Wood (2010) give details of all the legislation pertaining to the shark fisheries.

'Sharkwatch' was launched in July 2009 as part of the Darwin Reef Fish Project. The aim of the programme is to collect baseline information on shark populations and assess the effectiveness of the ban on shark fishing and trade of shark products in terms of changes to shark populations in Maldivian waters.

This report covers the third year of the Sharkwatch programme and details survey results for the period July 2011 – June 2012. It hence follows the same format as those set in the earlier reports (Ushan and Wood, 2010, Ushan, Sattar and Wood, 2011). During the first year of the project, 14 resorts participated and provided survey data, while 12 resorts and 1 safari boat provided data during the second year. 13 resorts and 1 Dive Centre (operating in an inhabited island) provided for the third year of the project. It should be noted that 4 have been involved in the programme from the first year onwards.

The survey form which is provided to all participating resorts/dive centres is shown in Appendix 1. The programme uses the Roving Diver Technique to survey and area. Ushan and Wood (2010) provide details of the sharkwatch methodology.

Results

Sites surveyed

A total of 2,951 surveys were carried out at 227 sites, over the period of July 2011 to June 2012. Both the number of surveys conducted and sites surveyed were greater in number than that for the last two survey periods. While the number of participating resorts and dive centres has remained almost the same over the years, the increased survey effort is an indication of increased interest both in the programme and in shark watching as an activity. Furthermore, while surveys over the past 2 years were mainly conducted in the central Maldives, it should be noted that for the third year, surveys were also undertaken by resorts/dive centres in north and south of Maldives, thus increasing the geographic spread of survey effort. A map of areas where surveys were undertaken is shown in Appendix 2.

The highest number of surveys to be made at a single site was 246 surveys, while approximately 50% of the sites were surveyed only one to two times. 31% of all sites were surveyed once. Figure 1 shows the number of surveys made at the top 20 sites which were surveyed (black bars).

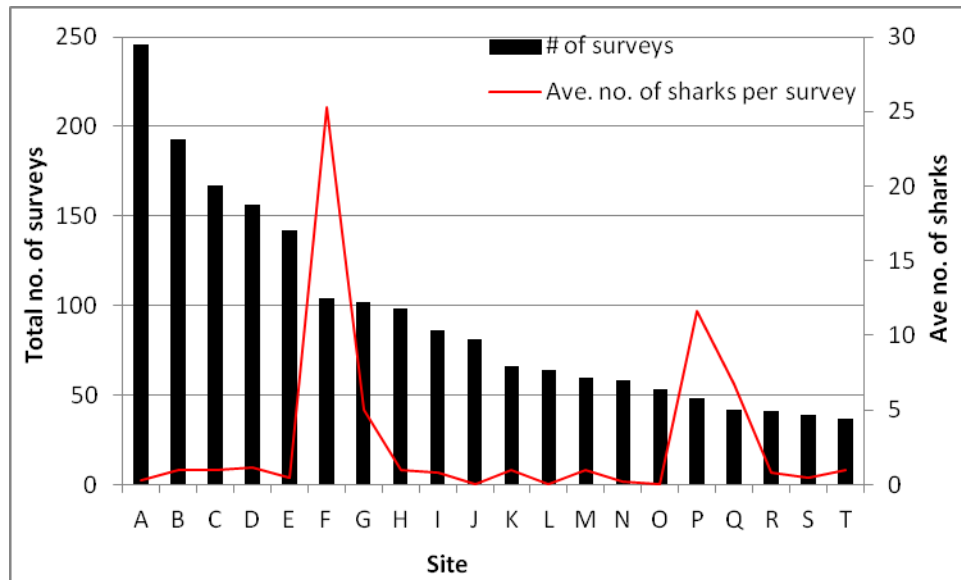


Figure 1. Number of surveys carried out at the most frequently surveyed sites during the period July 2011 - June 2012 (note these sites have not been named at the request of the Dive Centers providing the data). Also note that the site designation A, B, C etc in this chart are not comparable with sites A,B,C in the previous reports.

Figure 1 shows the number of surveys carried out at the top 20 sites surveyed during the period of July 2011 to June 2012. As noted, site designations A,B,C are not the same as in previous monitoring reports (Ushan and Wood, 2010; Ushan, Sattar and Wood, 2012) as the top twenty sites for the three periods were found to be different. However, 6 sites which fell into the top 20 category for the 2nd year of the survey period were also seen to fall into this category for the third year of the survey period.

The average number of sharks seen per survey at these sites varied between zero sightings to as many as 25.2 sharks per survey (Figure 1). Participants in Sharkwatch were requested to carry out surveys at as many dive sites as possible and *not* just to select those that were recognized as shark sites. This explains the lack of correlation between the number of visits and the number of sharks seen. For example the most visited site had a very low density of sharks but was surveyed many times because it is a dive site that is close to a Dive Centre dedicated to shark watching and is on their regular diving itinerary.

Figure 2 shows the frequency distribution of total number of sharks seen on each survey. As depicted from the figure, 1 to 10 sharks were observed on the majority of all surveys (approximately 54% of surveys), while a breakdown of this category shows that 1 shark was observed on the majority of all surveys (41% of all surveys). No sharks were observed on approximately 40% of all surveys.

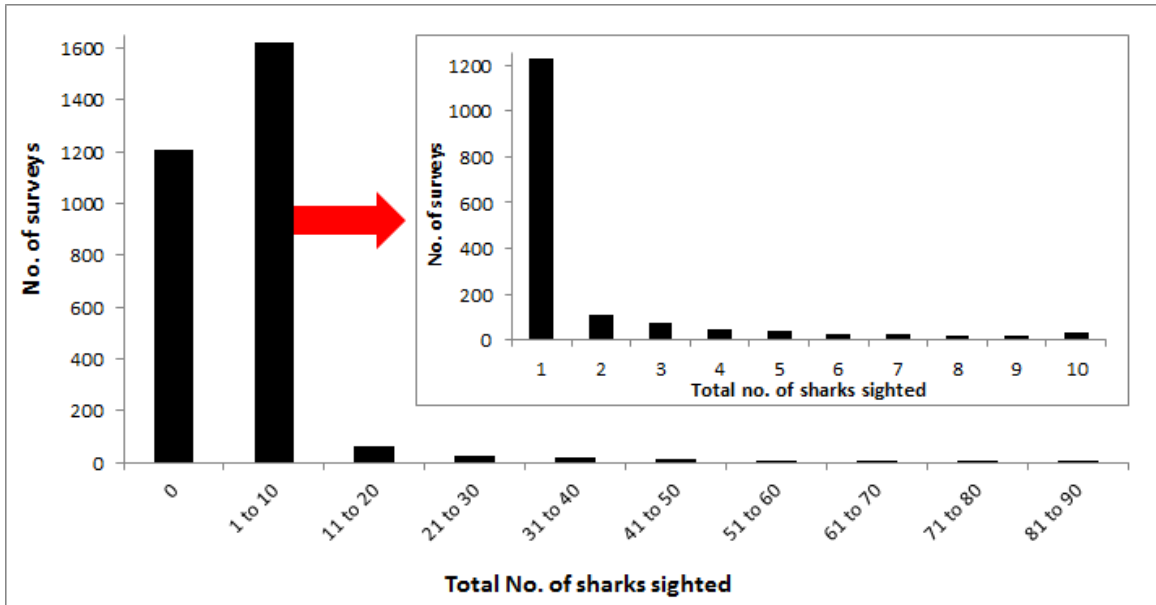


Figure 2. Frequency distribution of total number of sharks sighted on all surveys. The smaller chart shows a breakdown of the category of 1 to 10 sharks sighted

Figure 3 shows the average number of sharks/survey and percentage of sites which report these numbers.

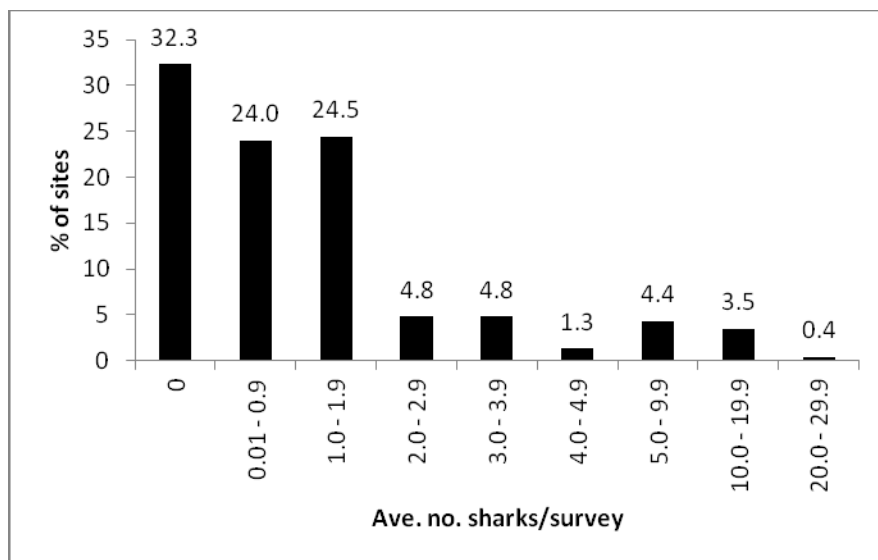


Figure 3. The average number of sharks seen per survey for the period between July 2011 and June 2012

Sharks were seen at 68% of the sites, while 32% of the sites reported no shark sightings. On average 2.14 sharks were recorded for every survey. An average of 1 to 2 sharks/survey were observed at approximately 25% of the sites.

Species and abundance

A total of 6,329 sharks were recorded during the 12 month survey period from July 2011 to June 2012 (no. of surveys = 2,951). Figure 4 shows a breakdown of sharks recorded as per the species listed in the survey form and in table 1 below.

Table 1. Species of sharks listed on the survey form

Code	English name	Scientific name
BRS	Blacktip Reef Shark	<i>Carcharhinus melanopterus</i>
WRS	Whitetip Reef Shark	<i>Triaenodon obesus</i>
GRS	Grey Reef Shark	<i>Carcharhinus amblyrhynchos</i>
SHS	Scalloped Hammerhead Shark	<i>Sphyrna lewini</i>
SS	Silvertip Shark	<i>Carcharhinus albimarginatus</i>
TNS	Tawny Nurse Shark	<i>Nebrius ferrugineus</i>
VS	Variegated Shark	<i>Stegostoma fasciatum</i>
WS	Whale Shark	<i>Rhincodon typus</i>
OT	All other Sharks	

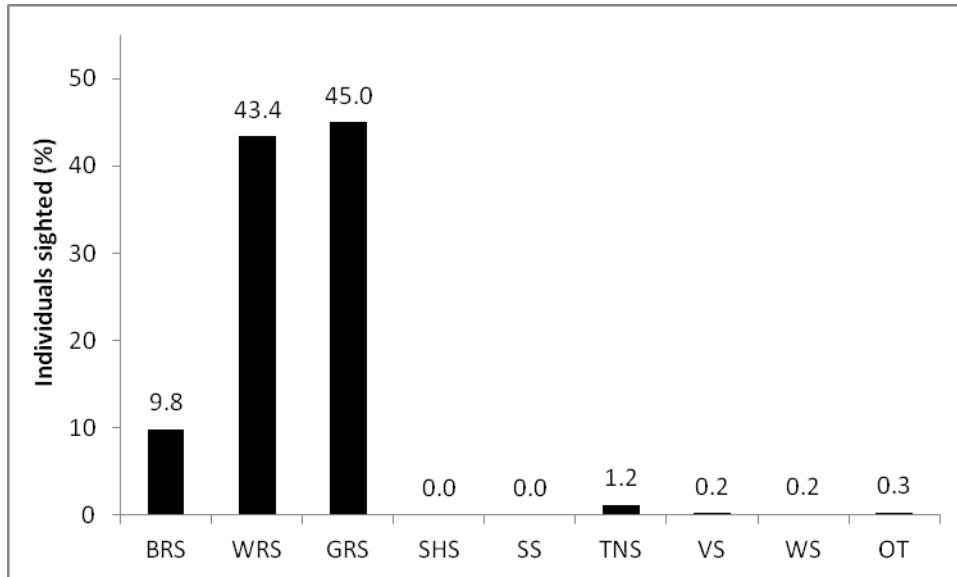


Figure 4. Percentage composition of sharks by species observed between July 2011 – June 2012 (n = 6,329)

The most commonly recorded species of sharks for the period of July 2011 to June 2011 is seen to be the Grey Reef shark, closely followed by the Whitetip Reef shark. This is in contrast to the two previous survey periods, when Whitetip Reef shark was the most commonly observed species. The percentage composition of Whitetip Reef shark is comparable to that of the second survey period, while there is a marked increase in the percentage of Grey Reef shark recorded. There is also a marked decrease in the percent composition of Blacktip Reef shark which was the second most commonly observed species for the period of July 2010 to June 2011.

While there is a marked increase in number of Grey Reef sharks from the period of July 2010 to June 2011 to the current survey period (July 2011 to June 2012), it should be noted that one of the sites where this species was most recorded during the current survey period was also amongst the top 20 sites surveyed during the period of July 2010 to June 2011. A look at the data from this particular site for last year shows that the highest number of this species were recorded from the same site last year as well. Results such as these indicate and stress the importance of continued long term monitoring of particular sites to assess changes to the shark populations. Currently, because the sites surveyed vary from year to year, it is less easy to pick up trends.

Abundance by species and month

Analysis of shark sightings by species and month of sighting shows that in contrast to the earlier survey periods where Whitetip Reef sharks were more prominent, the Grey Reef shark was recorded in greater numbers for all months of the current survey period. The Whitetip Reef shark which was most commonly recorded for earlier survey periods, does not show a clear pattern as to sightings for different months. As stressed in earlier reports, such seasonal trends can only be established with continued monitoring of the same sites for a number of years.

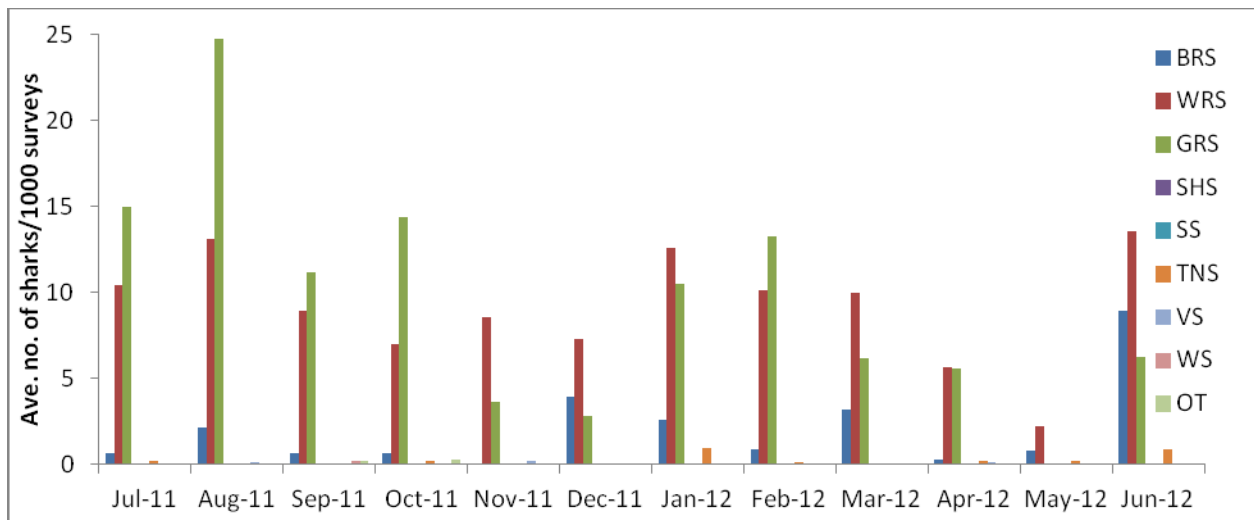


Figure 5. Average number of individual sharks seen per 1000 surveys (all sites combined) on a monthly basis from July 2011 – June 2012

Discussion

This report presents the results of the 3rd year (July 2011 to June 2012) of the Sharkwatch survey programme, which was started in June 2009. Results show that by far the largest number of surveys were undertaken over this period since the start of the programme, with a total of 2,951 surveys carried out at 227 sites. A total of 13 resorts and 1 Dive Centre participated over the year and a total 6,329 sharks were recorded.

Although a total of 227 sites were surveyed over the one year period, about 50% of these sites were surveyed only once or twice. However, on the other end there were sites which were surveyed as many as 246 times, while about 6% of the sites were surveyed more than 50 times. The greater survey effort at the sites is likely to be connected to the dive schedules of the participating centres whereby some sites are visited on a very regular and sometimes daily basis. Some observers filled in Sharkwatch data forms every time they dived, rather than perhaps doing one Sharkwatch survey a week, and so this easily explains the large number of reports for some popular dive sites (which are evidently not necessarily good shark sites).

In contrast to the two earlier survey periods (July 2009 to June 2010 and July 2010 to June 2011) the current survey shows a greater abundance of Grey Reef shark, whereas the earlier surveys showed Whitetip Reef shark to be the most abundant species. This may have been due to a different suite of sites being surveyed and true trends can only be established with longer term monitoring and comparisons between different sites.

An average of 2.14 sharks were recorded per survey which is comparable with the data from the last two survey periods (2.03 and 2.18) (Ushan and Wood, 2010 and Ushan, Sattar and Wood, 2011). Overall sharks seen per survey ranged between no sightings to as many as 25.2 sharks per survey. Total number of sharks recorded per survey was 1 for 41% of all surveys, while no sharks were observed on 40% of the surveys.

Sharks sightings were a common occurrence for the majority of sites, with sharks being sighted at 68% of the sites surveyed. However, this is a lower number of sites where sharks were seen, in comparison to sites reported for the last 2 survey periods. This may be due to a wider range of sites being surveyed rather than a drop in distribution / occurrence of sharks.

Seasonal trends in shark sightings are difficult to establish due to reasons such as short survey time and different survey sites. This emphasizes the importance of continued monitoring of selected sites to assess changes to population and establish seasonal trends. It also underlines the importance of participation by more resorts/dive centres, so as to enable the monitoring of a greater number of sites and increased survey effort.

A combined analysis of 4 years' data (duration of the Darwin Reef Fish Project) will also be undertaken shortly and we hope results of all these reports will be an incentive for participation by others to continue monitoring the effect of shark ban on shark populations. It is only through such monitoring that we can show the positive effect of a properly enforced ban on the fishery so as to ensure that the ban on shark fisheries is sustained in face of protests by fishermen.

Acknowledgements

The authors would like to thank all the resorts and dive centres who participated in the Sharkwatch surveys during the survey period of 2011 to 2012, namely:

Cocoa Island

Four Seasons Maldives at Kuda Huraa

Four Seasons Maldives at Landaa Giraavaru

Gili Lankanfushi Maldives

Kuramathi Island Resort

Kuredu Island Resort

Lazy Gecko Dive Centre (N. Velidhoo)

LUX* Maldives

Niyama Maldives

One and Only Reethi Rah

Royal Island Resort and Spa

Six Senses Laamu

Velassaru Maldives

W Retreat and Spa Maldives

We also express our gratitude to the Darwin Initiative for funding the Darwin Reef Fish Project and enabling the Sharkwatch Programme to take place. We also thank all the Staff of the Marine Conservation Society of UK and the Marine Research Center of Maldives who have assisted us during various phases of the programme and Darwin Reef Fish Project.

References

Ushan, M. and Wood, E. (2010) Maldives Sharkwatch Report 2009 to 2010, Marine Research Centre, Marine Conservation Society, 16pp

Ushan, M., Sattar, S. A. and Wood, E. (2011) Maldives Sharkwatch Report 2010 to 2011, Marine Research Centre, Marine Conservation Society, 13pp

Appendix 1 - SHARKWATCH RECORD FORM

Observer name(s):

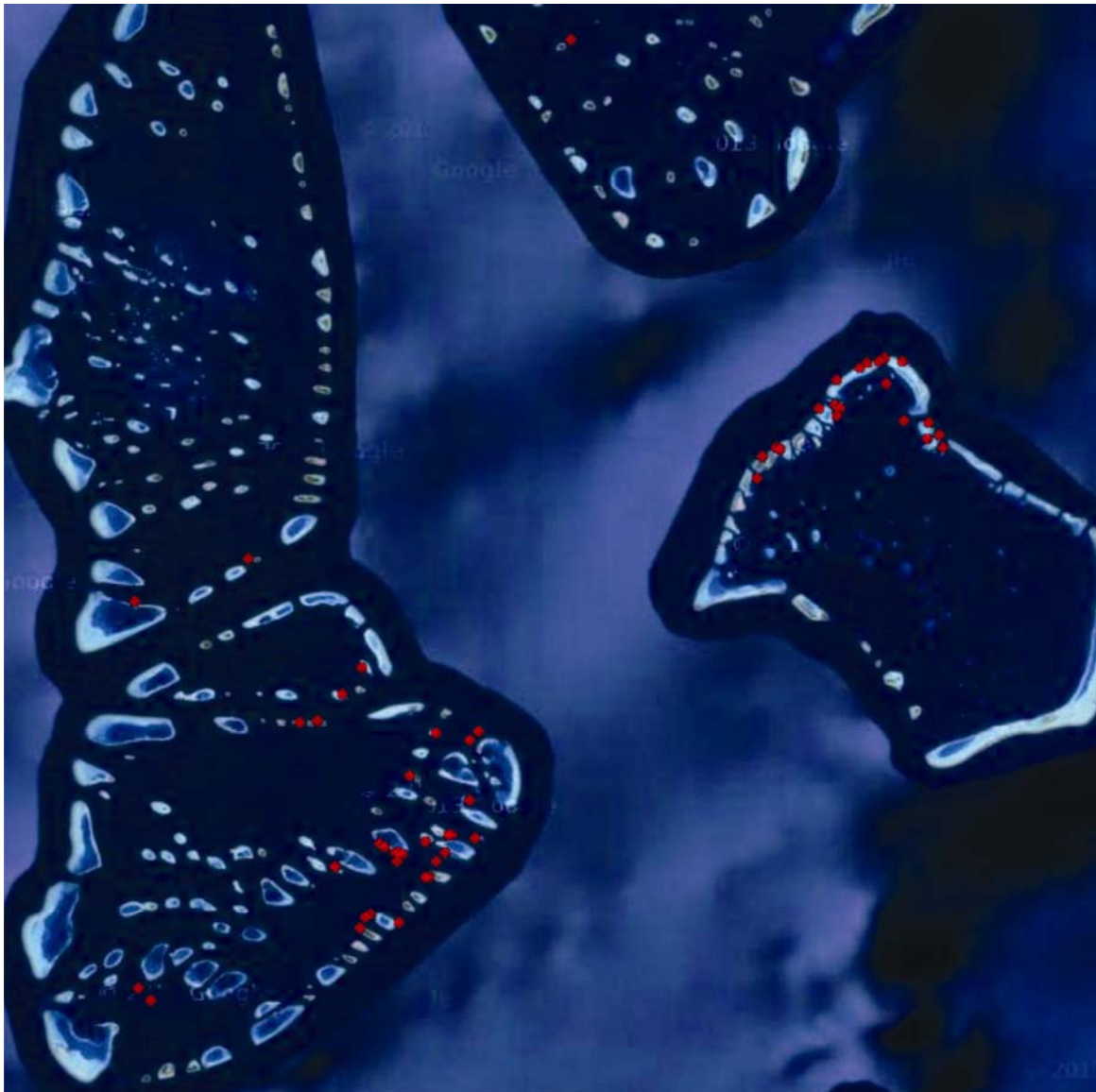
Resort name:

Atoll:

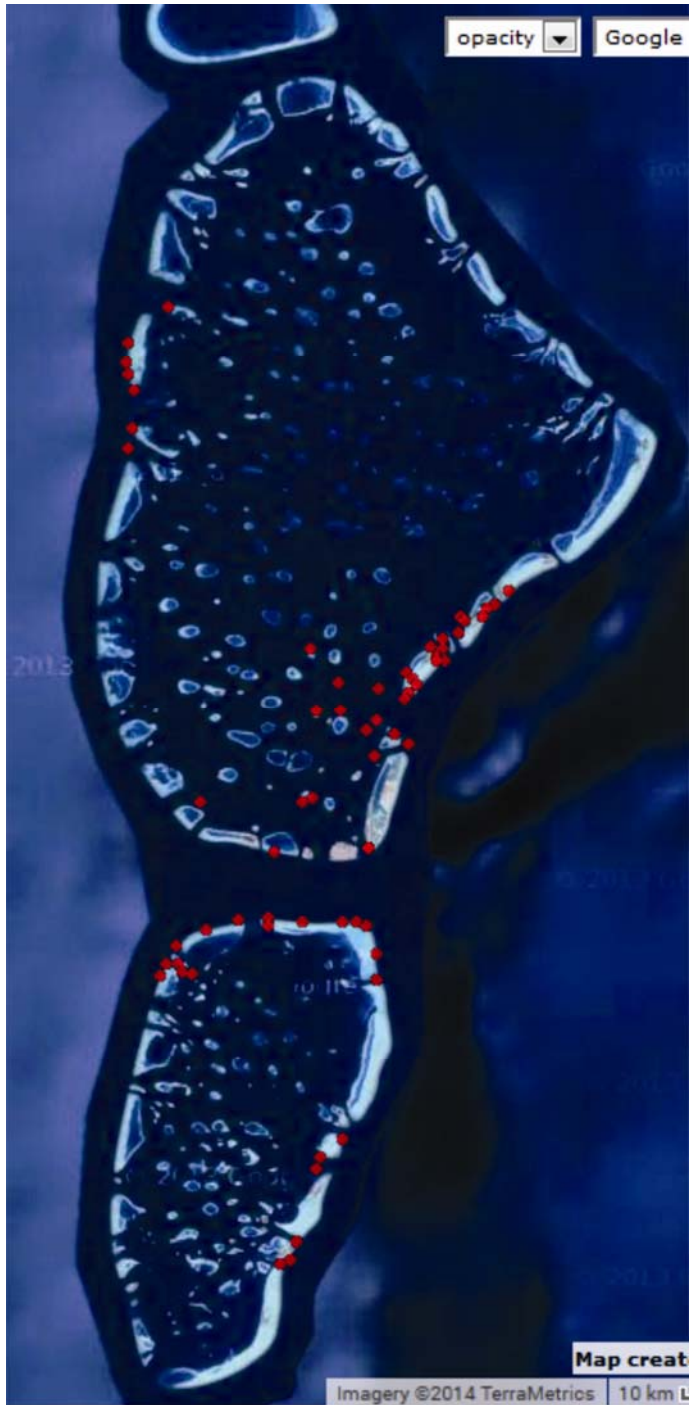
Dive details									Number of sharks observed								Notes	
Date	Site	Location (reef crest, water column, channel etc)	Currents (none, weak, strong)	Estimate horizontal visibility metres	Water temp °C	Max. Depth	Start time	Dive duration	BRS	WR S	GRS	SHS	SS	TNS	VS	WS	OT	Please include notes on sex of sharks if known and on any sharks with identifying marks e.g BRS 4 x F; 1 x M WS long scar on back

Appendix 2 – Map of survey areas as reported by participating resorts (Maps created on a google aerial map, using GPS visualizer, www.gpsvisualizer.com) *Note: 51 sites not plotted, as we were unable to get coordinates from resorts

Survey areas in the northern atolls



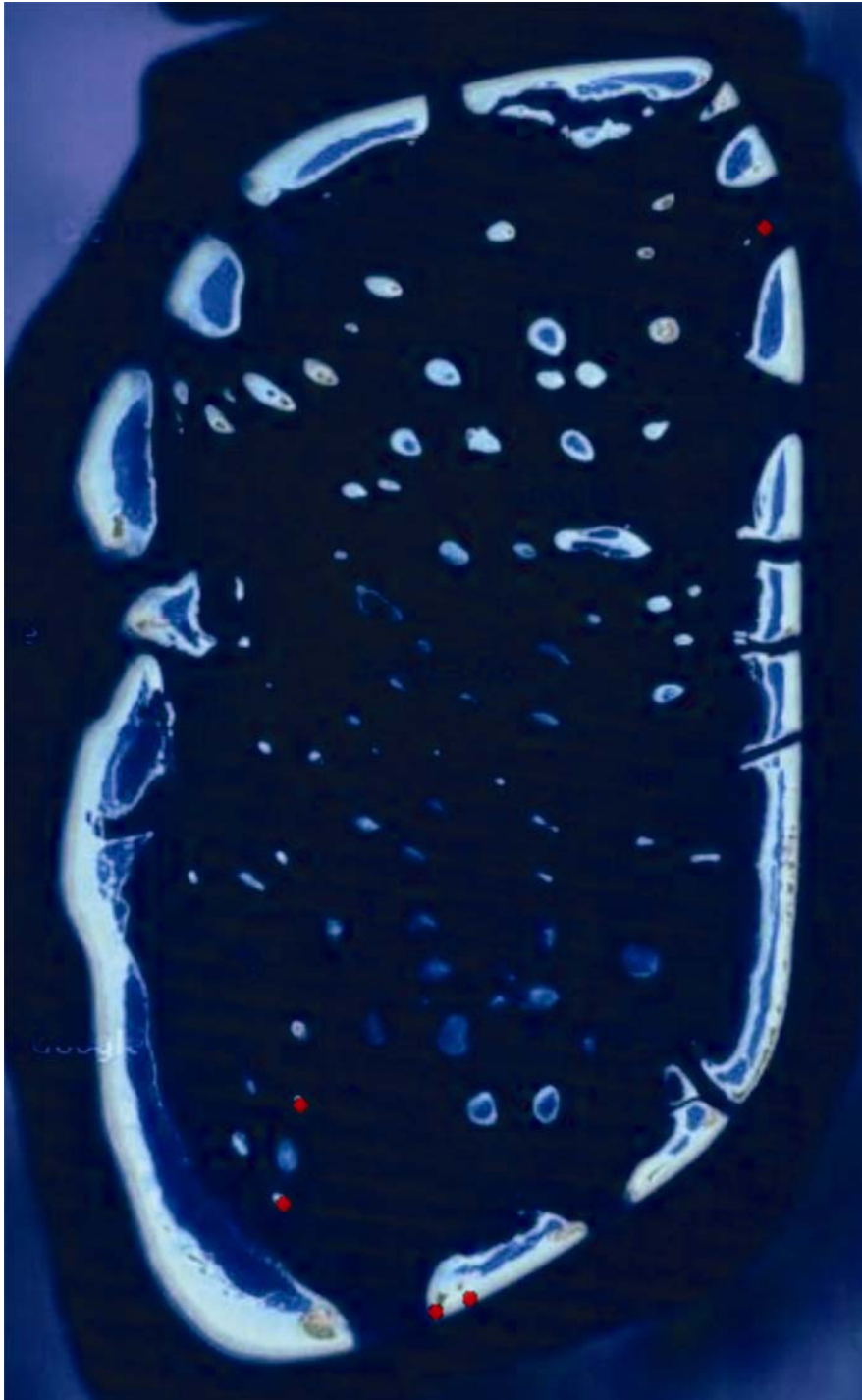
Survey areas in North and South Male' atoll



Survey areas in North and South Ari atoll



Survey areas in Dhaalu atoll



Survey areas in Laamu atoll

