

Maldives Sharkwatch Report

2010-2011

A Scallop Hammerhead shark swimming near "MaizanNeru" of HAHDHUNMATHI ATOLL (LAAMU) ,Photo: Mohamed Ali)



Maldives Sharkwatch Report for 2010 - 2011

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.
- Following the fishery ban, a ban on trade of all shark products was implemented under the Environmental Protection and Preservation Act on 21st July 2011.
- Over the period July 2009 to June 2011, 'Sharkwatch' surveys have been carried out by dive schools at resorts in Baa Atoll, Lhaviyani Atoll, North and South Male' Atoll, Rasdhoo Atoll And HaaAlifu Atoll.
- This report covers the second year of the programme, from July 2010 to June 2011, when a total of 2121 Sharkwatch surveys were carried out at 181 sites.
- A total of 4306 sharks were recorded during July 2010 - June 2011. The most frequently sighted species during this 12 month period were white tip reef sharks followed by the black tip reef sharks and grey 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.
- 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.

Introduction

Sharks are top predators in the food chain. They play an important ecological role in the marine environment, particularly on coral reefs. Due to their biological characteristics of slow growth, late maturity and low fecundity, sharks are very vulnerable to over-exploitation and stock recovery in such instances is very slow. Shark liver oil was historically used in the Maldives in the boat building industry. The fishery for shark intensified in late 1970s due to the realization of the export value of shark products, such as dried shark fin and salted shark meat. Shark liver oil started contributing towards exports in the mid 1980s (MRC, 2008).

Legislation designed to protect sharks was first introduced in the mid 1990s and has gradually been extended, as summarized below:

- **24th June 1995:** Whale shark (*Rhincodontypus*) declared a protected species under Article 3 of the Fisheries Regulation of Maldives.
- **A 10 year moratorium was declared in 1998** on all types of shark fishing inside and within 12 miles from the rim of 7 major tourism atolls in the Maldives (Baa, Lhaviyani, Kaafu, North Ari, South Ari, Vaavu and Addu). For a number of reasons, this was not fully implemented.
- **1st March 2009:** Legislation introduced prohibiting the killing, capture or extraction of any species of sharks within 12 miles of the outer rim of all Maldivian atolls.
- **15th March 2010:** Legislation introduced prohibiting the killing, capture and extraction of any shark species within Maldivian waters, inclusive of the Exclusive Economic Zone.
- **21st July 2011:** Introduction of a ban on catching, keeping in captivity, trading or harming any species of shark under the Environmental Protection and Preservation Act (Ministry of Housing and Environment lu'laan 138/1/2011/42).

However, the mandate to ban the trade of any commodity lies within the jurisdiction of the Ministry of Economic Development, rather than the Ministry of Environment, so the legal status of the current trade ban is unclear. The Ministry of Fisheries and Agriculture has been negotiating with the Ministry of Economic Development to introduce a trade ban of sharks and shark products, and an announcement is expected soon (Sinan *et.al*, 2011)

'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 is the second Sharkwatch report, covering the period 2010 - 2011. When the project was launched 27 resorts showed an interest in the project, but only 14 resorts provided data for the year 2009 - 2010. During 2010 to 2011 we received data from 12 resorts and one safari boat.

For the second year of the project there were slight changes to the protocols and form to be used in the data collection. The revised form can be found in *Appendix 1*.

Sites Surveyed

Over the period July 2010 - June 2011, a total of 2,121 Sharkwatch surveys were carried out at 181 sites. This is 460 surveys more than the first year, but at 15 fewer sites. Maps to show the geographic spread of the surveys are shown in *Appendix 1*. It is important to note that many of the sites surveyed in 2010 - 2011 had not been surveyed in the previous year.

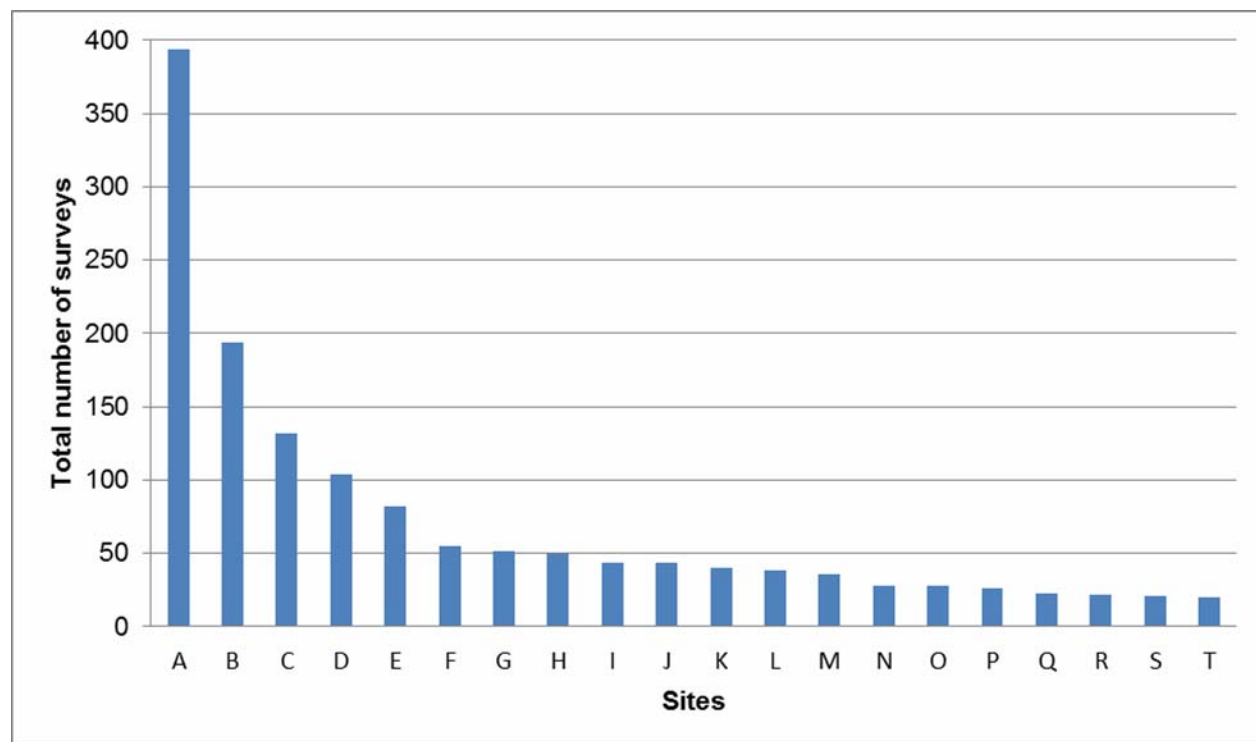


Figure 1. Chart showing the number of surveys carried out at the most frequently surveyed sites during the period July 2010 - June 2011 (note these sites have not been named at the request of the Dive Centers providing the data). Also note that the site designation A, B, C etc in this chart are not comparable with sites A,B,C for 2009-2010 in the previous report.

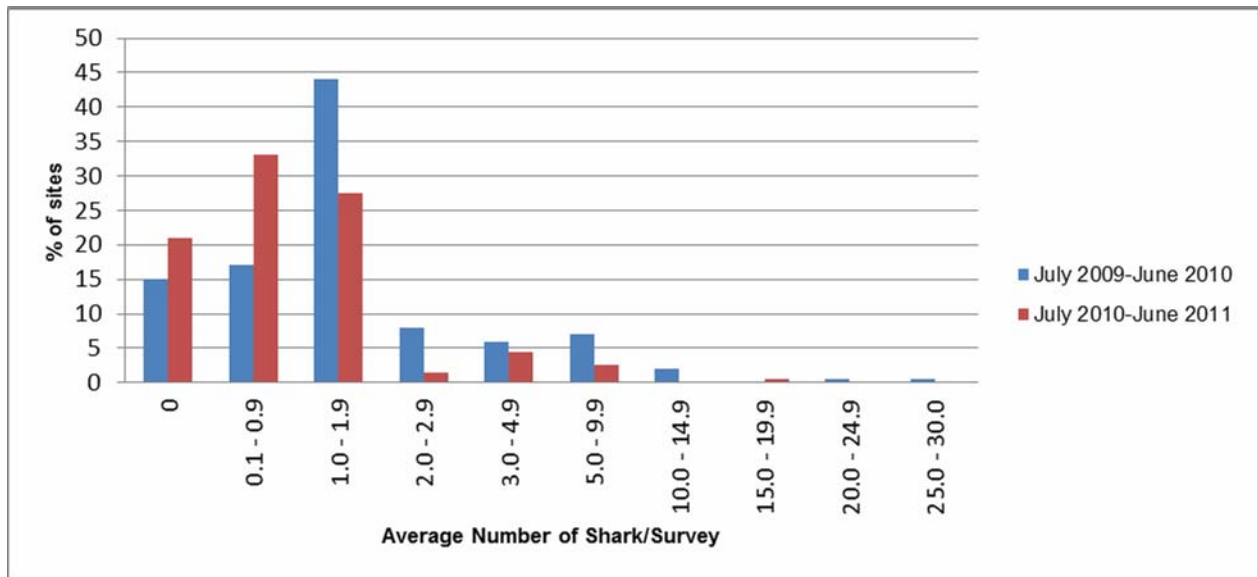


Figure 2. The average number of sharks seen per survey during July 2009 - June 2010 and July 2010 - June 2011.

In the second, year sharks were seen at 79% of the sites surveyed of which 30% of sites had an average of 1 shark recorded per survey.

During the first year sharks were seen at 85% of the sites surveyed and 44% of sites had an average of 1-2 sharks recorded per survey.

For the period of July 2010-June 2011 the top site for shark sightings had an average of 30 sharks/survey (n=2 surveys conducted) with 2 surveys less than last year. The second best site had an average of 20 sharks/survey (n=2 surveys conducted which is 3 surveys less than first year). The other sites had an average of between 4-9 sharks per survey. The top site for the period of July 2009-June 2010 for sharks had an average of 27 sharks/survey (n=4 surveys conducted). while the second best site had 21 sharks/survey (n=5 surveys conducted). The other sites in the top twenty had an average of between 5-10 sharks per survey.

As noted above the top 20 sites for July 2009 - June 2010 are different from those for the period of July 2010 - June 2011 because a different set off sites were surveyed by the participating Dive Centres. The sites are not named as it was considered ill-advised to advertise these shark hot-spots and thereby possibly encourage poaching.

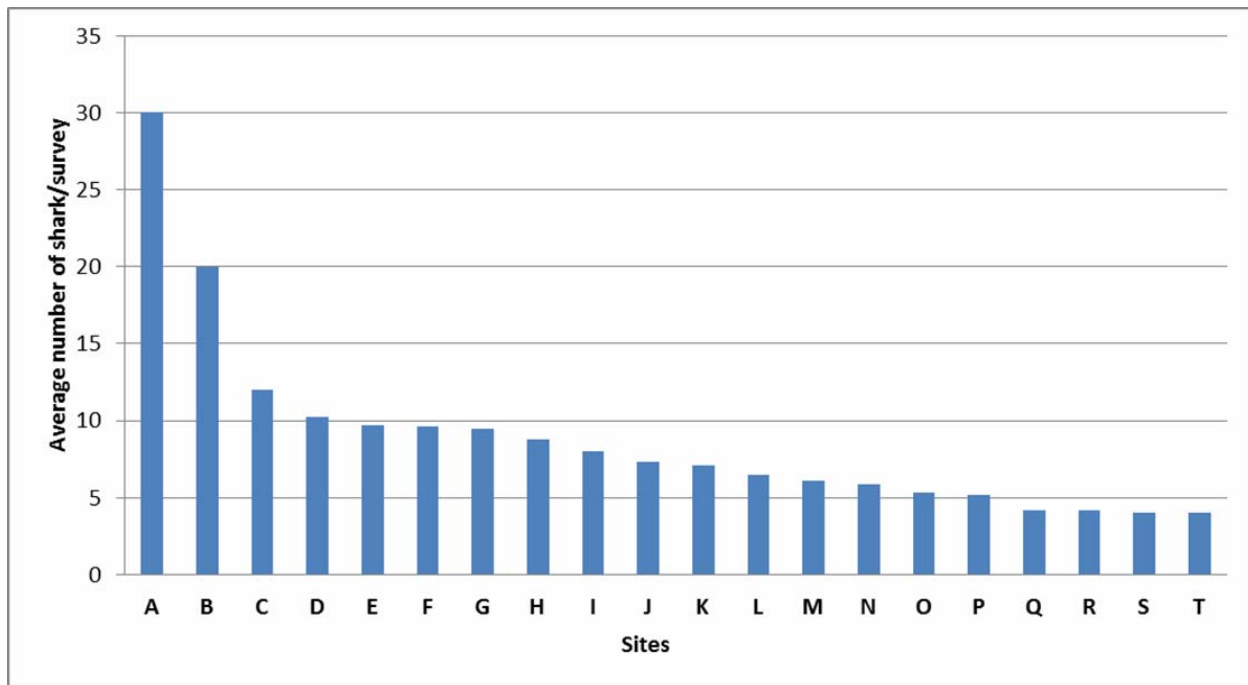


Figure 3. Ranking of the top twenty sites surveyed to show those with the highest average number of shark recorded per survey (July 2010 - June 2011). Not that the site designations A, B, C etc in this chart are not comparable with site A, B, C for 2009 - 2010 in the previous report.

Abbreviation Chart:

- BRS Blacktip Reef Shark (*Carcharhinus melanopterus*)
- WRS Whitetip Reef Shark (*Triaenodon obesus*)
- GRS Grey Reef Shark (*Carcharhinus amblyrhynchos*)
- SHS Scalloped Hammerhead Shark (*Sphyrna lewini*)
- SS Silvertip Shark (*Carcharhinus albimarginatus*)
- TNS Tawny Nurse Shark (*Nebrius ferrugineus*)
- VS Variegated Shark (*Stegostoma fasciatum*)
- WS Whale Shark (*Rhincodon typus*)
- OT All other Sharks

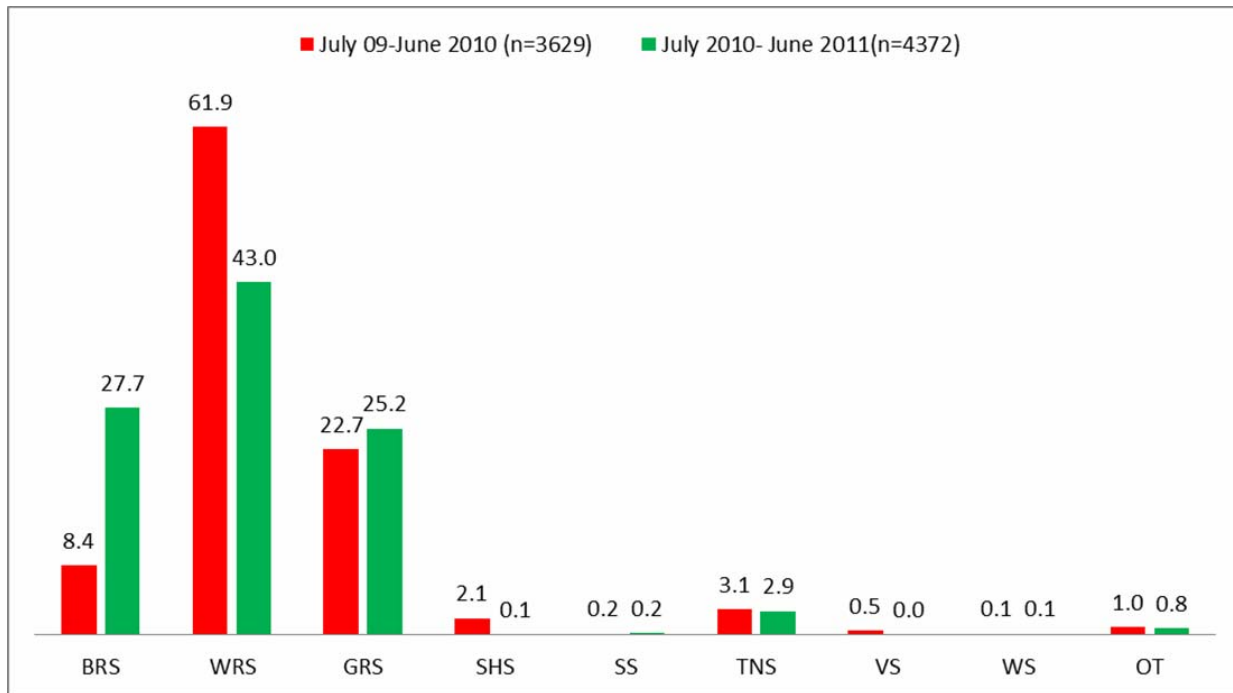


Figure 4. Percentage composition of sharks by species observed between July 2009 – June 2010 (n=3630) and July 2010 – June 2011 (n=4306).

A total of 4372 sharks were recorded during the 12 month survey period from July 2010 – June 2011 (Number of surveys = 2121) and 3629 sharks from July 2009 – June 2010 (number of surveys =1661). The most frequently recorded shark species for both years was the whitetip reef shark. The second most frequently recorded species in the period 2009 - 2010 was the grey reef shark while in 2010-2011 it was the blacktip reef shark.

There is a pronounced difference in the total number of black tip reef sharks in the two survey years, with significantly more recorded in the second year. However, as mentioned previously, different sites were surveyed and this could be one of the explanations for the disparity.

Abundance by species and month

For both years there was a slight increase in sightings during August to September for whitetip reef shark. The other noticeable pattern was an increase in numbers of whitetip reef shark sighting in December 2009 rising to a peak in January 2010 then gradually declining until low numbers were seen by May 2010 (figure 6). This pattern was not seen in July 2010 – June 2011 (figure 5).

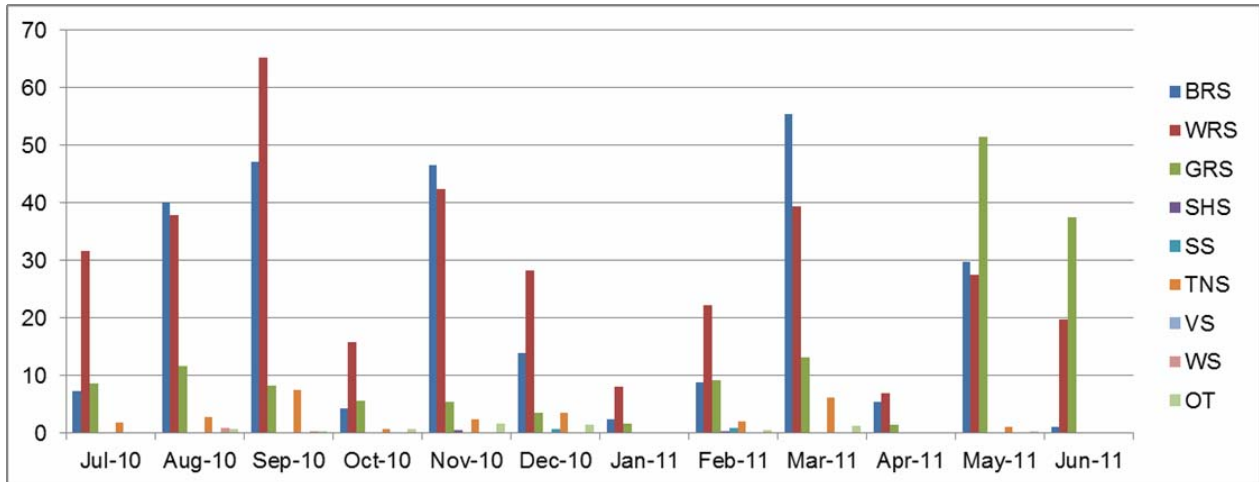


Figure 5. Average number of individual sharks seen per 1000 surveys (all sites combined) on a monthly basis from July 2010 – June 2011.

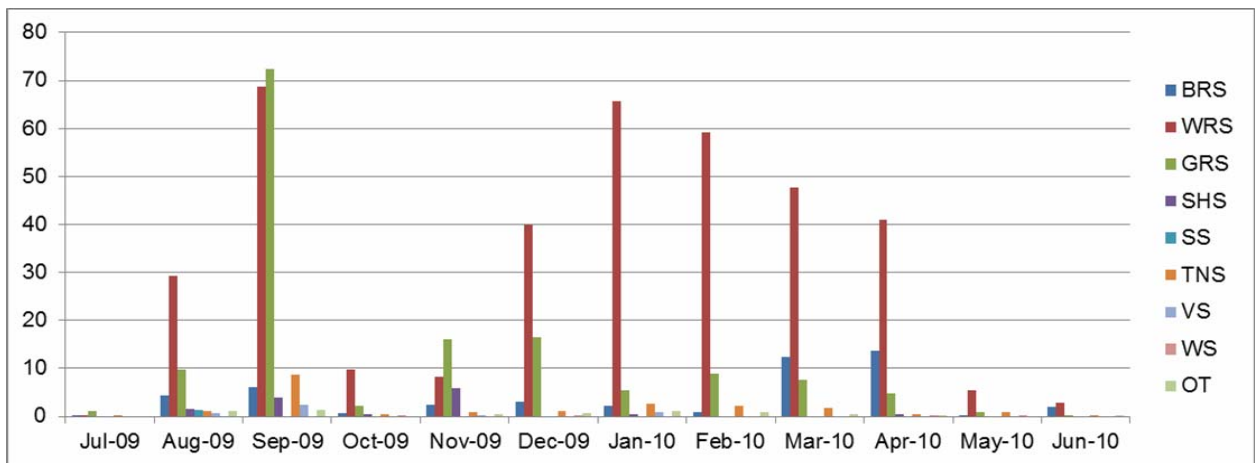


Figure 6. Average number of individual sharks seen per 1000 surveys (all sites combined) on a monthly basis from July 2009 – June 2010.

Discussion

A total of 2121 surveys were conducted at 181 sites over the period July 2010 – June 2011 and a total of 4306 sharks were recorded. 12 resorts and 1 safari boat took part in conducting the surveys. In July 2009 – June 2010, 1661 surveys were conducted at 196 sites, with 14 resorts taking part. 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.

Sharks appear to be relatively widely distributed, occurring at 79% of the sites surveyed in 2009-2010 and 85% of the sites surveyed in 2010-2011. Whether this is representative of the Maldives reefs as a whole is difficult to tell because the survey sites are 'regular dive sites' which will have been selected on the basis of being attractive and interesting for divers to visit. They may therefore be biased towards 'shark sites'.

Sharkwatch is providing baseline data on shark populations in Maldives and it is important that the programme continues and is expanded to draw in more participants and include all the atolls and varieties of reef type. It would also be useful to establish a selection of the some of the richest shark sites as permanent monitoring sites in order to provide long-term data on population trends.

The programme was established as part of the 4 year Darwin Reef Fish project under a partnership between the Marine Research Center and Marine Conservation Society (UK) and will be continued in a long term by the Marine Research Center. The successes of the programme will depend on the co-ordination and data analysis provided by Marine Research Center as well the commitment and involvement of the Tourism Sector and voluntary assistance from the dive centers.

Acknowledgment

The authors would like to thank all the dive centers and resorts who have participated in the survey and enabled us to continue with this programme. 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

MRC (2008) Status of Maldivian Shark Fisheries 2 (In Dhivehi), Marine Research Centre, Ministry of Fisheries, Agriculture and Marine Resources, Male', 33pp)

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

Sinan,H., Adam, M.S. & R.C. Anderson .(2011) Status of Shark Fisheries in the Maldives. Paper presented at the WPEB-2011. Lankanfinolhu, North Malé Atoll, Republic of Maldives, 9 p)

Appendix 1

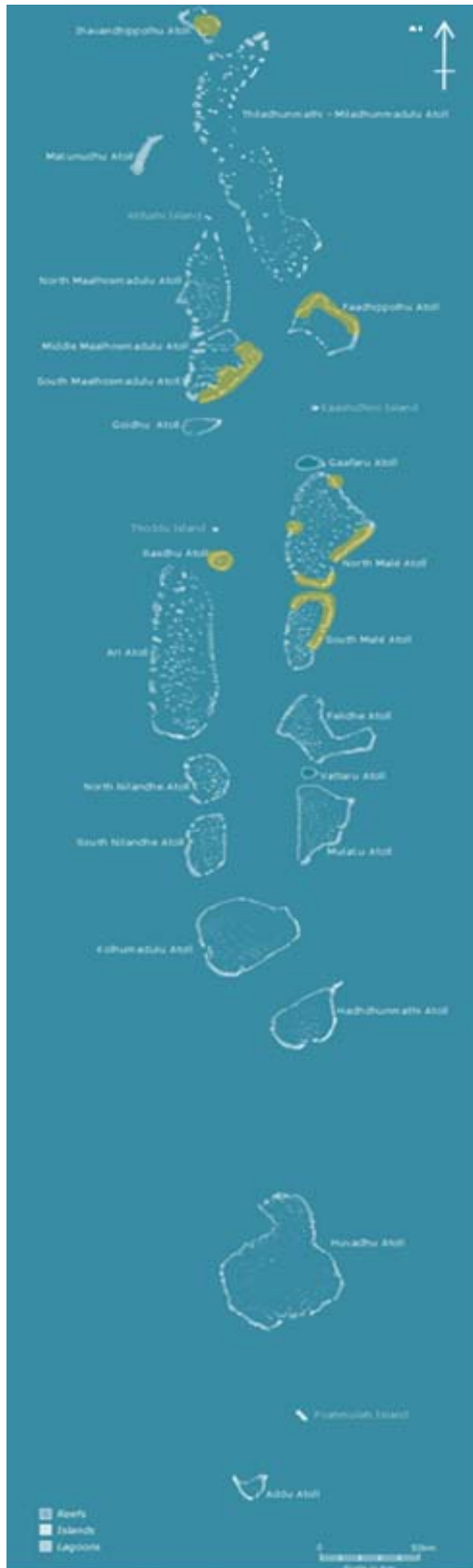
SHARKWATCH RECORD FORM

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



Map of Maldives: Areas highlighted in yellow are where surveys were carried out.

List of resorts participating in Sharkwatch July 2010 - July 2011

Resorts	2010						2011					
	July	August	September	October	November	December	January	February	March	April	May	June
Embudhoo												
Royal island												
Fourseason Kudahuraa												
Beach house manafaru												
Kuramathi												
Taj exotica												
Cocoa island												
Adaaran prastigues Vadhoo												
Baros												
Fourseason landaagiraavaru												
Anantaraa												
four season sea explora												
Velassaru												
W resort												