

## The Rufford Foundation Final Report

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Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to [jane@rufford.org](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
Your name	Christine Dudgeon
Project title	Spot the leopard shark – Thailand: Community-based photo-identification monitoring program for leopard sharks <i>Stegostoma fasciatum</i> in Thailand.
RSG reference	13499-1
Reporting period	Final Report
Amount of grant	£3000
Your email address	c.dudgeon@uq.edu.au
Date of this report	15 June 2015

**1. Please indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.**

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Establish a long-term monitoring project of leopard sharks in Thai waters			Yes	The project was launched on Phi Island August 2013 through the Adventure Club diving centre. The project rapidly expanded to encompass most of the dive centres in the Phi island region and then was expanded on subsequent trips to include more of the Phuket, Koh Lanta, Krabi, Khao Lak and Gulf of Thailand dive centres. We have received extra support from a Thai based NGO, Shark Guardian who advertise the project through their education programmes, as well as support from the equipment distributors who send out flyers with equipment shipments. The Facebook medium has enabled the project to be accessed by thousands of people in Thailand and abroad.
Educate the community about leopard sharks and methods for taking and submitting photos for data.			Yes	We distributed thousands of flyers, postcards and stickers advertising the project, directing interested individuals to Facebook and web sites as well containing information on the project, instructions on how to take and contribute photographs, as well as codes of conduct for how to approach leopard sharks in the wild to minimise disturbance to the sharks and their habitat.
Investigate patterns of site-fidelity of leopard sharks in Thai waters			Yes	We have obtained baseline data to be able to identify important sites that are used frequently by leopard sharks. We have also demonstrated different site preferences among individual leopard sharks. Furthermore, we have identified locations where large population declines appear to have occurred and warrant further investigation.
Estimate baseline population size for leopard sharks in Thai waters			Yes	The photo contributions have enabled us to provide a baseline population estimate for leopard sharks in the Phi-Phi Island/Phuket region for the first year of the project. As of December 2014 we had received over 540 photographs of leopard sharks from 96

				contributors across the three major locations in Thailand. From these photos 200 individual leopard sharks have been identified with photos spanning back to 2010.
Provide a framework for the citizen science project to expand to other regions of Thailand and species			Yes	<p>We commenced expansion of the project from the Phi-Phi Island region to the Gulf of Thailand and NW Andaman Sea regions.</p> <p>The citizen-science/photo identification approach has been adopted by Shark Guardian to commence a similar approach to the collection of data for threatened whale sharks in Thai waters.</p>

**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

Overall the project has been very successful and the contributions and involvement of the diving community in Thailand has well surpassed initial expectations. There were some delays in the project during 2014 to the political unrest in Thailand with the military takeover of the government. This meant that travel by C. Dudgeon to Thailand was delayed by a few months until the situation had settled down. With the complimentary funding we were able to extend the project until the end of 2014 to enable travel during the high season on the Andaman coast, thereby being able to maximise the number of interactions with dive centres and potential contributors.

**3. Briefly describe the three most important outcomes of your project.**

- This project has established baseline population numbers for leopard sharks in Thai waters as well as identifying important sites and habitats for these animals.

We have received over 540 photographic contributions spanning back to 2004. From all photo contributions combined (as of December 2014) there have been 200 individual sharks identified. The discovery curve of identified sharks (Figure 1 attachment) has not flattened out suggesting that several sharks are still yet to be identified. Since the launch of the project in August 2013, 101 sharks have been sighted and display individual variation in their site-preferences and frequencies of sightings (August is used as the baseline here as most photographs contributed after this date contain the highest resolution of data). In particular, 67 of these sharks have only been sighted once with nine sharks having been sighted more than five times. One male and female shark have been sighted on 17 and 22 different occasions respectively (Figures 2 & 3 attachment). These sharks have displayed different site preferences to each other. Overall, the vast majority of sharks have been sighted around the Phi Phi/Phuket dive sites. In particular, the most frequented sightings come from Hin Bida, also known as Shark Point Phi Phi (Figure 4 attachment). This site is of particular concern as it does not have any marine park protection as given to other sites in the region and therefore, the susceptibility of sharks to capture at this site is very high.

2. This project has identified dramatic population declines of leopard sharks in two regions of Thailand (Gulf of Thailand and the North-West Andaman Sea region).

Preliminary investigations into leopard shark sightings in the Gulf of Thailand and NW Andaman Sea Region (Similan Islands, Surin Island) have revealed major declines in the populations. Only one sighting has been reported from divers in the Gulf of Thailand post 2008 (recently sighting in May 2015) and very few sightings observed in the NW Andaman Sea region (five in total between August 2013 and December 2014 reported). Anecdotal reports suggest that leopard sharks were previously more common in both locations and therefore populations have declined potentially due to overfishing, habitat destruction and/or other causes. More directed research is required to assess the decline in populations and potential causes.

3. The project has raised the profile of the threatened leopard shark species in Thailand and general knowledge and status of this species by the Thai Conservation and Fisheries agencies, Thailand based diving community and the broader international community through the Facebook medium. The findings from this project have highlighted conservation concerns for this species in Thai waters as well as important locations that require protection. This awareness and information is a critical first step in providing data that can be used to implement conservation measures for leopard sharks.

**4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).**

This project has facilitated several collaborations. The primary collaboration has been between the lead scientists C. Dudgeon from Australia with Dr Kongkiat, the Head of the Endangered Species Unit, Phuket Marine Biological Centre (PMBC). Although one quarter of all shark and ray species are considered threatened by the International Union for the Conservation of Nature, only one species, the whale shark, currently receives any local protection in Thailand through a threatened species listing. This project has enabled baseline data to be obtained and provided to the PMBC for a threatened species that currently does not have a local Thai listing.

A collaboration with Mr Tassapon Krajangdara at the Andaman Sea Fisheries Research and Development Center was established whereby Mr Tassapon provided fish market survey data to the project and C. Dudgeon assisted in return through conducting molecular analyses to confirm the identification of some unknown shark and ray species collected from fish markets. Connections were also established with academic staff at Chulalongkorn University in Bangkok and the Prince of Songkhla University for potential future collaborations.

## **5. Are there any plans to continue this work?**

Yes, this work is on-going. We have received a 2-year extension to conduct the research by the National Research Institute of Thailand with support from Dr Kongkiat at the Phuket Marine Biological Centre (PMBC). We will be seeking further funding to cover the travel costs of C. Dudgeon to Thailand to report on the findings to the major contributors in the dive community and PMBC after the 2-year period. We will be seeking funding to establish a more rigorous survey of diving and fishing communities to ascertain the apparent dramatic population declines of leopard sharks in the Gulf of Thailand and NW Andaman Sea regions. We will also be seeking funding to support further website development to enable the sharing of the findings of the research more readily with the public as well as for printing of posters to provide to dive and education centres around Thailand outlining key findings and facts regarding leopard sharks in Thailand.

## **6. How do you plan to share the results of your work with others?**

The findings from this work have been shared as regular updates posted on the project Facebook site as well as through public presentations. The Facebook site is set up as a community site so that anyone can upload pictures or comments and has received 992 likes in total. Most photographic contributions are submitted through Facebook, which enables any interested parties to follow sightings of different sharks. Between August 2013 and December 2014 the project has received over 540 photo contributions from 96 contributors. There have been regular contributions of photos since the project launch with an average of 31 photos contributed per month and with each month having new contributors joining the project.

C. Dudgeon has visited 70 different dive centres around Thailand to advertise to project through the dissemination of advertising material (flyers, postcards and stickers) and face-to-face conversations with staff. Furthermore, C. Dudgeon has given eight 1-hour public presentations in Thailand to the diving tourism industry and the Phuket Marine Biological Centre, as well as in Australia to The University of Queensland.

Future plans to share work include: compiling posters to be distributed to dive and education centres outlining key findings and facts about leopard sharks in Thai waters; creating an informative and user friendly website to post reports, facts and findings and information on individual sharks; publishing findings in a scientific journal.

## **7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?**

The Rufford Foundation funding was used over the period of August 2013-December 2014. The project was extended by 6 months due to political uncertainty in Thailand and personal family obligations for C. Dudgeon restricting travel.

**8. Budget: Please provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used.**

The Rufford Foundation covered a portion (£3000) of the total requested funding (£5630). Complementary funding for this project was received through the Australia-Thailand Institute (ATI) (total funding \$ 10700 AUD). This enabled us to expand the project to include preliminary investigations at the Gulf of Thailand and North-West Andaman Sea areas as well as increase the coverage in the Phi-Phi Island/Phuket region. The discrepancies between the budgeted and actual amounts outlined in the table below are due to differences in the costs covered by the Rufford Foundation and the ATI. As specified in the acceptance letter to Mr Josh Cole for the grant dated 10 July 2013, the funds were used primarily to cover flights and accommodation for two trips to Thailand by C. Dudgeon.

The actual amounts given are converted from AUD using the original conversion for the funding application of 1 Australian Dollar = 0.688UK pounds.

Item	Budgeted Amount	Actual Amount	Difference	Comments
2 x Economy airfares from Brisbane Australia – Thailand	1900.00	1596.16	-303.84	Please see the paragraph above regarding the discrepancy between the budgeted amount and actual amount due to receiving complementary funding for the project from the ATI.
Accommodation	1260.00	1656.46	-396.46	
Local transport	270.00	42.81	227.19	
SCUBA diving	600.00	0	600.00	
Advertising and educational materials	1000.00	121.10	878.91	
Temperature loggers	600.00	0	600.00	
<b>Total</b>	5630			

**9. Looking ahead, what do you feel are the important next steps?**

The project has received fantastic support from the diving community around Thailand.

There are some major findings that we have identified that require further investigation.

1. Leopard sharks appear to be almost entirely gone from the Gulf of Thailand. During the visit to the Gulf of Thailand in August 2014, it became apparent that leopard sharks had not been sighted by divers for several years. After speaking with 20 operators working in the region for over 8-10 years, the last sightings were approximately 7 years ago. Recently a diver posted a recent sighting of a leopard from the Gulf of Thailand, which is the first one in these 7 years. These preliminary results are a major concern, suggesting that the leopard shark population in this region is in critical condition. What is required to assess this effectively is to conduct more comprehensive surveys throughout the diving community in the Gulf of Thailand as well as with the fishing community to obtain more detailed information on previous sightings of leopard sharks versus current sightings or catch rates.
2. Leopard sharks also appear to have largely gone from the NW Andaman Sea region of the Similan and Surin Islands and Richelieu Rock. Preliminary surveys and collected data for the project suggest that fewer than 10 individuals are sighted in this region within a year, with anecdotal reports suggesting that leopard sharks were much more commonly seen in the area prior to 2010. The Andaman Sea Fisheries reports show that leopard sharks are regularly observed in low numbers on the fish markets in the NW Andaman Sea port of Ranong. It is important to collect more information on landings and prior sightings through market surveys and surveys of fishermen and the diving community to ascertain the extent of the population decline.
3. We will continue monitoring the populations around Phi Phi Island and Phuket with photo submission through the diving industry. There are several dedicated and enthusiastic contributors who are keen to see the project continue. Most of the contributions have been provided through the expat community and we are working with the PMBC and local Thai scientists to engage the Thai diving community through translating the project information and distributing through local Thai dive clubs.

**10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?**

Yes. The Rufford Foundation logo was included in advertising material for the project. Copies of the advertising material have been emailed as attachments.

These included:

1. 3 fold A4 flyers - 5000 pieces
2. Postcards - 4000 pieces
3. Posters - eight pieces.

**11. Any other comments?**

The project has received good publicity and has been the subject of two news articles written in the Phuket Gazette newspaper for Thailand:

14 November 2013:

[http://www.phuketgazette.net/articles/articles/get\\_article\\_detail/22781#ad-image-0](http://www.phuketgazette.net/articles/articles/get_article_detail/22781#ad-image-0)

9th December 2015:

<http://www.phuketgazette.net/phuket-news/Phuket-learns-database-swimming-leopard-sharks-video/40714#ad-image-0>

This project was also the subject of a news article written for the Earth Touch News online news site (date):

27 April 2015:

<http://www.earthtouchnews.com/conservation/conservation/can-you-be-facebook-friends-with-a-shark-yes>

This project was the subject of a magazine article written for the Scuba Diver Australasia Magazine (Issue 5, 2014).

This project is primarily run through a Facebook account. There are currently 977 followers of the page and in general posts reach 300-1000 people, with one post of leopard shark carcasses on a fish market reaching >50,000 people.