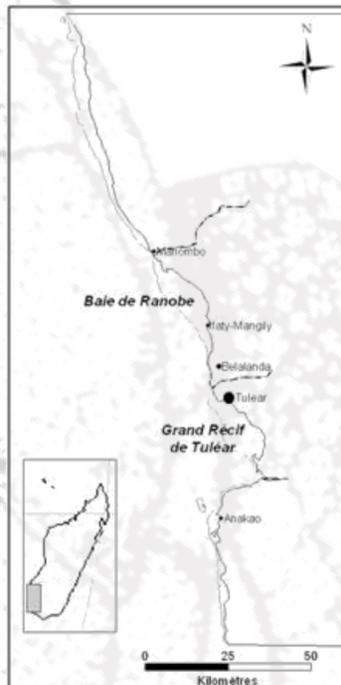


FOUR YEAR STUDY OF THE SOCIAL, ECONOMIC AND BIOLOGICAL ASPECTS OF THE MARINE TURTLE FISHERY, BAY OF RANOBE, SOUTHWEST MADAGASCAR

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In terms of its natural resources Madagascar is perhaps best known for its unrivalled biodiversity that plays an important role in providing food and income for rural communities. In the semi-arid, region of Toliara, south-west Madagascar, harsh living conditions and years of drought have driven more-and-more people towards the coast to eke out an existence from already over-exploited coastal ecosystems. ReefDoctor, a UK marine conservation NGO stationed in the Bay of Ranobe (BRB) has been developing research, conservation, and education programs in this challenging region since 2002. Located 25km north of the regional capital of Toliara, the BRB is a semi-enclosed lagoon and a sub-section of the Récif Complex de Toliara, encompassing a diverse range of ecosystems. The 'Récif Complex de Toliara' stretching from Androka to Belo-sur-Mer is an abundant foraging ground and migratory route for many species of marine turtle¹. However, identifying the foraging strategies of marine turtles remains a challenge² and research is needed to provide an understanding the populations that utilize this stretch of water.



Indigenous coastal communities of Southwest Madagascar, referred to as Vezo, obtain approximately 84% of their income from the marine environment. Communities of this region are affected by hunger, poverty, low incomes, or low wealth⁷ leading to over-exploitation of natural resources⁸. The consumption of marine turtle is an integral aspect of Vezo culture and marine turtles to hold intrinsic spiritual, economic and subsistence values^{4,5}. Customs demand the consumption of turtle meat^{6,7} to communicate with the ancestors, and bringing good fortune⁶. Turtle eggs are traded by the Vezo for food, and turtle oil is used in traditional healing practices¹. However, research indicates that irrespective of the utilization of marine turtles sustainably in the past, marine turtles represent enormous wealth to the Vezo community and concerns are being raised over the stability of these exploited populations. Integrating fisheries management and community-based conservation efforts utilizing traditional ecological knowledge ReefDoctor's innovative working model for marine turtle community-based conservation was instigated in 2008, safeguarding marine turtles and their associated habitats and significantly contributing to the protection of marine turtles in the BRB, providing a platform for conservation efforts in the Western Indian Ocean



ReefDoctor's evaluation of the marine turtle fishery over the past four years indicates that the capture, trade, and wholesale of turtle meat is widespread, turtle meat has a high economic value and all segments of society are partaking in its consumption. Until recently, the marine and coastal environment was managed by central and local government, largely without the participation of local communities this resulted in: a lack of support by resource user groups, low levels of compliance, and ineffective controls on exploitation. Five species of marine turtle are targeted by hunters, *Chelonia mydas* (green turtle), significantly dominates the fishery (97%). Estimates of annual income indicate an increase from US\$5365 in 2009 (US\$1.48 per kg) to US\$12200 in 2012 (US\$2 per kg). Over the same time period, average length (straight carapace) decreased from 78 cm in 2009 to 69 cm in 2012; the capture of large individuals has become rare.

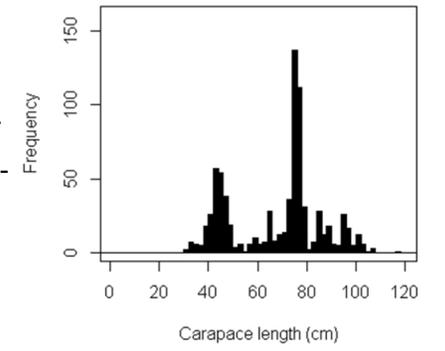


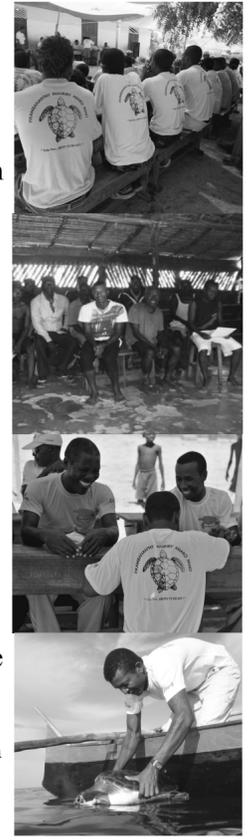
Figure 1: Length-frequency histogram of *C. mydas* populations exploited in the BRB

Table 1: exploitation of marine turtles in the BRB over a four years

Species	No of turtles recorded in the fishery				Total	Percent dominating the fishery	Curved Carapace Length (cm)	
	2009	2010	2011	2012			Mean ± SD	Range
Green	143	137	157	459	924	97	73.6 ± 20.3	21 - 120
Hawksbill	4	9	0	3	16	0.9	64.0 ± 14.8	50 - 94
Loggerhead	1	1	0	6	8	1.7	73.4 ± 18.9	37 - 92
Olive Ridley	0	0	0	4	4	0.4	71.8 ± 16.5	47 - 82

* Leatherback turtles *Dermochelys coriacea* are infrequently caught in the North of the BRB

Since 2008, ReefDoctor has been working towards the integration of fisheries management strategies into grassroots community conservation initiatives. This has provided the foundation for the Vezo community to develop their own approach towards the sustainable exploitation of marine turtles. Community conservation efforts transitioned into a grassroots movement by turtle hunters to protect their identity and livelihood through the protection of marine turtles. Fikambanana MPaniriky Miaro ny Fano (FI.MPA.MI.FA) - association of fishers for the protection of marine turtles gained legal status in 2012. In 2013, FI.MPA.MI.FA implemented the first traditional law (dina) preventing the exploitation of turtles under 70cm throughout thirteen communities, with an estimated population of over 20,000 people. Each of the 13 communities formed turtle protection teams composed of elders and fishermen who are responsible for the maintenance of the dina, reducing conflict and providing a platform for marine turtle protection in the region. In October 2013, in partnership with Kelonia marine turtle observatory FI.MPA.MI.FA tagged and released the first turtle in the BRB. **Acknowledgements:** Funding for this project was provided by Rufford Small Grants Foundation and ReefDoctor.org. Thank you to all who have provided support and encouragement for the RD Fano project, a special thank you to Douglas Hykle, George Hughes, Gilbert Francois, Ronel Nel, Stephane Ciccione, Vola Ramahery,



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