

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

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ReefDoctor (RD), a UK marine conservation NGO has been stationed in the Bay of Ranobe (BRB) since its foundation in 2001. Located 25km north of the regional capital of Toliara, the BRB is a semi-enclosed lagoon and a sub-section of the Récif Complexe de Toliara, encompassing a diverse range of ecosystems. The 'Récif Complexe de Toliara' stretching from Androka to Belo-sur-Mer is an abundant foraging ground and migratory route for many species of marine turtle<sup>1</sup>. However, identifying the foraging strategies of marine turtles remains a challenge<sup>2</sup> and research is needed to provide an understanding the populations that utilize this stretch of water. The close working relationship RD has developed with the local community has provided a platform to addressing cultural sensitive issues such as the exploitation of marine turtles. In 2008, ReefDoctor with sponsorship from the Rufford small grants foundation pioneered a vanguard conservancy program to evaluate the marine turtle fishery and implement community conservation initiatives to promote sustainable exploitation.



Indigenous coastal communities of Southwest Madagascar, referred to as Vezo, obtain approximately 84% of their income from the marine environment<sup>8</sup>. Communities of this region are affected by hunger, poverty, low incomes, or low wealth<sup>7</sup> leading to over-exploitation of natural resources<sup>8</sup>. The Vezo consider marine turtles to hold intrinsic spiritual, economic and subsistence values<sup>4,5</sup>. Customs/taboo demand the consumption of turtle meat<sup>6,7</sup> to communicate with the ancestors, and bringing good fortune<sup>6</sup>. Turtle eggs are traded by the Vezo for food, and turtle oil is used for sustenance and traditional healing practices<sup>1</sup>. Irrespective of the Vezo utilization of marine turtles sustainably in the past, it is now evident that indigenous knowledge that prevented the over-exploitation has been eroded over the generations. Yet, research indicates that effective management and conservation efforts utilizing traditional ecological knowledge<sup>9</sup> can significantly contribute to ecosystem recovery, safeguard biodiversity, and increase fisher's incomes<sup>10</sup>.

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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. Marine turtles represent enormous wealth to the Vezo community and concerns are being raised over the stability of these exploited populations. All five species of marine turtle present in Madagascan waters 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.

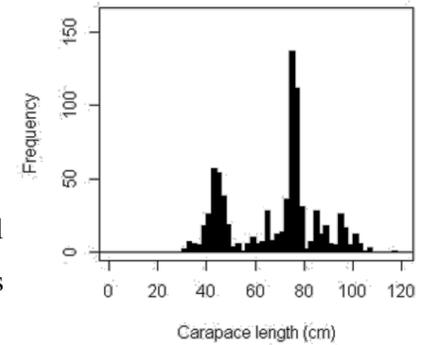
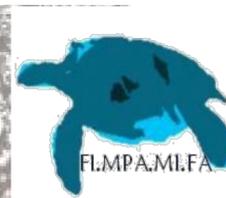


Figure 1: Length-frequency histogram of *C. mydas* populations exploited in the BRB

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



During the course of this project the 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 (FIMPA.MI.FA) was formally recognised by the Malagasy government as a legal association in 2012. Focusing on reducing the illegal exploitation of marine turtles in the Bay of Ranobe, FIMPA.MI.FA seeks to synthesise indigenous knowledge into a practical fisheries management framework. Earlier this year the first dina or traditional law preventing the hunting of turtles under 70cm was implemented throughout thirteen communities, with an estimated population of over 20,000 people. In addition, each of the 13 communities have formed turtle protection teams composed of elders and fishermen who are responsible for the maintenance of the dina, largely reducing conflict and providing a platform for marine turtle protection in the region. In October 2013, in partnership with Kelonia marine turtle observatory FIMPA.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,

