

Nesting beach revegetation and its influence on green turtle (*Chelonia mydas*) conservation in Réunion Island

Stéphane Ciccione¹ & Jérôme Bourjea²

¹*Kelonia, the marine turtle observatory of Réunion Island, 46 rue du G1 de Gaulle, Saint Leu, La Réunion*
E-mail : stephaneciccione@kelonia.org

²*Ifremer de La Réunion, Laboratoire Ressources Halieutiques*

Before its colonisation, Réunion Island, a French island in the southern Indian Ocean, was described by navigators as an important nesting site for marine turtles (Loungon, 1992). Unfortunately, intensive catches, the introduction of predators (such as rats), habitat degradation (beaches), and the fast development of coastal areas have led to a near disappearance of nesting marine turtles along the coast of this island. Between 1990 and 2002 only three marine turtle nesting events were observed in Réunion: one nest in 1994, one nest from which hatchlings emerged in 1996, and two

tracks on a beach in 2002. These nesting events occurred at three different sites along the west coast of Réunion.

Nevertheless, despite the low numbers of turtle nesting there has also been one observation of green turtles mating near the west coast of Réunion Island and observations made by ULM (Ultra Light Motorised) and by boat have clearly documented the presence of adult green turtles in the waters around Réunion Island (Sauvignet *et al.*, 2000; Jean *et al.*, *in press*).



Figure 1: Children are involved with ecological restoration of the littoral vegetation in Réunion Island. Photos: Bontoux, 2005

In 1999 a programme concerning the ecological restoration of marine turtle nesting beaches was initiated. Implemented by the CEDTM (Centre d'Etude et de découverte des tortues marines de La Réunion), it aims for the ecological restoration of the vegetation in the littoral zone. The upper beach vegetation provides protection against human activities along the coast and also plays a role in nest site choice by female sea turtles. In fact, this vegetation may serve as an important orientation clue

for sea turtles near the coast, when prospecting for potential nesting sites (Luschi *et al.*, 2001; Hays *et al.*, 2003). However, many people remained sceptical about the potential impact of this programme on marine turtle nesting activity in Réunion Island. In spite of this, the Ferme Corail beach in St Leu was selected as a pilot beach because of its proximity to the CEDTM and its geomorphological and physical characteristics, i.e., sand quality, its width, low human frequentation, and little construction.

The alien species *Casuarina equisetifolia* (which had been planted to stabilize the dunes) and *Prosopis chilensis* (an invasive species) were gradually removed and indigenous species (*Ipomoea pes-caprae*, *Vigna marina*, *Canavalia rosea*, *Scaevola taccada*, *Heliotropium foertherianum*, *Thespesia populnea*) were planted. This programme was linked with an awareness programme to involve children in this ecological restoration (Figure 1). The choice of the species planted took into account the particular substrate of this sector of the island, which is composed of a mix of coral and basaltic sand and protected by a coral reef (Boulet, 2008). The species planted have a preference or a

tolerance for the salty spray.

In June 2004, the first tracks and the first nesting green turtles (*Chelonia mydas*) were observed on the Ferme Corail beach. Under CEDTM surveillance, the nesting activity was followed up and nesting green turtles and their nests were monitored. Since June 2004, 12 of the 13 nesting events that have been observed on the west coast of Réunion Island, took place on the Ferme Corail beach (Table 1). An investigation showed that before the recent events, the last turtle track on a beach around Saint Leu had been reported in 1960.

Date	Beach name	No. of tracks	Species	No. of nests	Female Tag	Female size CCL (cm)	Clutch incubation period (days)
01/06/2004	Ferme corail	1	Cm	0			
19/06/2004	Ferme corail	1	Cm	0			
21/06/2004	Ferme corail	1	Cm	0			
21/06/2004	La cafrine	1	Cm	0			
23/06/2004	Ferme corail	1	Cm	1	-	-	-
23/06/2004	La cafrine	2	Cm	0		-	
11/07/2004	Ferme corail	4	Cm	2		-	82
						-	85
29/07/2004	Ferme corail	4	Cm	1		-	83
18/08/2004	Ferme corail	2	Cm	0			
19/08/2004	Ferme corail	1	Cm	1	RUN0014	106	81
11/12/2004	Ferme corail	1	Cm	0			
12/12/2004	Ferme corail	1	Cm	0			
14/12/2004	Ferme corail	1	Cm	0			
18/12/2004	Ferme corail	1	Cm	1	RUN0015	109	53
14/10/2005	Ferme corail	1	Cm	1	-	-	-
27/01/2007	Nord Maharani	1	Cm	1	-	-	51
01/06/2007	Ferme corail	1	Cm	1	RUN0088	102	87
16/06/2007	Ferme corail	1	Cm	1	RUN0088		116
02/07/2007	Ferme corail	1	Cm	1	RUN0088		106
19/07/2007	Ferme corail	1	Cm	1	RUN0088		98
08/08/2007	Ferme corail	1	Cm	1	RUN0088		90
Total		29		13			

Table 1: Marine turtle nesting activity on beaches in Réunion Island. Cm = *Chelonia mydas*, - = not observed



Figure 2: Female green turtle and its track on the restored beach of St Leu (Réunion Island).
Photos: S. Ciccione, 2007

We cannot be certain that the return of the nesting females is a consequence of the ecological restoration of the upper beach vegetation (Ciccione & Bourjea, 2006). However, the local increase in the number of nesting green turtles and hatching events on the rehabilitated beach (Figure 2) have justified the extension of this programme to others beaches of Réunion Island, involving new partners and administrations. Currently in 2009, 20 hectares of beach are used for rehabilitation projects motivated

by restoring marine turtle habitats. Marine turtles are now also taken into consideration in impact studies for infrastructure developments within the littoral zone. This illustrates how the success of a conservation programme can motivate politicians and investors, regardless of the reasons for its success.

Acknowledgement

We thank Manfred Enstipp for English correction.

Literature cited

Boullet, V. 2008. Proposition de listes d'espèces indigènes dans le cadre de la revégétalisation des plages coralliennes de Saint Leu. 24p.

Ciccione, S. & J. Bourjea. 2006. Nesting of Green Turtles in Saint Leu, Réunion Island. *Marine Turtle Newsletter* 112: 1-3.

Dizon, A.E. & G.H. Balazs. 1982. Radio telemetry of Hawaiian green turtles at their breeding colony. *Marine fisheries review* 44(5): 13-20.

Hays, G.C., S. Akesson, A.C. Broderick, F. Glen, B.J. Godley, F. Papi & P. Luschi. 2003. Island finding ability of marine turtles. *Pro Roy. Soc. Lond. B(suppl.)* 270: 85-87.

Jean, C., S. Ciccione, K. Ballorain, J-Y. Georges & J.

Bourjea, J. 2009. Accepted. Ultralight aircraft surveys reveal marine turtle population increases along the west coast of Réunion Island. *Oryx*.

Loungnon, A. 1992. Sous le signe de la tortue. Voyages anciens à l'île Bourbon. Lib. Gérard Saint Denis. Pp 1611-1725.

Luschi, P., S. Akesson, A.C. Broderick, F. Glen, B.J. Godley, F. Papi & G.C. Hays. 2001. Testing the navigational abilities of oceanic migrants: displacement experiments on green turtles (*Chelonia mydas*). *Behav. Ecol. Sociobiol.* 50: 528-534.

Sauvignet, H., A. Pavitrin, S. Ciccione & D. Roos. 2000. Premiers résultats des campagnes de dénombrements aériens des tortues marines sur la côte Ouest de La Réunion. *Bulletin Phaethon* 11 : 8-12.