



GNARALOO TURTLE CONSERVATION PROGRAM 2011/12

GNARALOO CAPE FARQUHAR ROOKERY

REPORT ON FIRST RECONNAISSANCE SURVEY (21 – 23 DECEMBER 2011)

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1. Introduction

Scientific data on sea turtle nesting in the Gnaraloo Bay Rookery (**GBR**) has been collected under the *Gnaraloo Turtle Conservation Program (GTCP)* since the season 2008/09. The GBR survey area currently monitored by seasonal GTCP scientific teams extends north from Gnaraloo Bay North (**GBN**) to Beach Point 9 (**BP9**), a distance of 6.7km. During aerial surveys undertaken for the GTCP during January 2010 (for the season 2009/10) and January 2011 (for the season 2010/11), the presence of an additional possible significant rookery north of BP9 to the Gnaraloo northern boundary was identified, since named the Gnaraloo Cape Farquhar Rookery (**GCFR**). It was not known at the time which turtle species frequented this area or whether it was used for mating, nesting, foraging and/or resting purposes.

GTCP scientific teams from 2009/10 and 2010/11 formally recommended that on-ground investigation of the GCFR be undertaken in future in order to gain a more precise understanding of sea turtle activity at Gnaraloo. Due to the proximity of the GCFR to the GBR, it was considered possible that nesting turtles may overlap between the two areas. Should this be the case, the recorded seasonal number of sea turtles at Gnaraloo may be an underestimation and the Gnaraloo rookeries may be more significant than previously known. Rather than reducing the significance of the GBR, extending monitoring to include the additional turtle rookery at the GCFR would enhance the body of scientific knowledge pertaining to sea turtles at Gnaraloo.

The Gnaraloo Environmental Advisor (**GEA**) and the GTCP scientific team 2011/12 prepared a written proposal for on-ground monitoring of the GCFR with a recommended scope of works and a cost / benefits analysis and presented it to the Gnaraloo leaseholder during October 2011. Upon review and consideration by the Gnaraloo leaseholder, approval was received for on-ground monitoring of the GCFR to commence during 21 – 23 December 2011, 21 – 23 January 2012 and 21 – 23 February 2012.

This report details the findings of the first formal monitoring survey of the GCFR as well as contain advice and recommendations for the further two approved surveys of the GCFR taking place during the season 2011/12.

2. GCFR Study Area 2011/12

Given the results of the aerial surveys undertaken for the GTCP during the seasons 2009/10 and 2010/11, it was proposed that the length of the GCFR to be monitored during surveys in 2011/12 be approximately 14km, located between the points -23.64168/113.61544 and -23.57697/113.69830. For comparison purposes, the GBR is 6.7km long.



The GCFR is an approximate return distance of 60km from the Gnaraloo Homestead area (a return distance of 45km from the locked Gnaraloo 6Mile gate). The GCFR is located approximately 22km north of the GBR.

3. Materials and methods

Beach patrols were conducted at first light each morning from 21 - 23 December 2011. The survey work was carried out by Kimmie Riskas (GTCP Team leader 2011/12) and by Fiona Morgan (GTCP GIS Cartographer 2011/12).

The GTCP researchers surveyed 2 sub-sections (refer Section 'Delineation of sub-sections in GCFR) of the GCFR during the December 2011 survey in order to identify turtle activity distribution and areas of high nesting density. Track and nest monitoring protocols and data sheets were identical to those used for the regularly monitored GBR.

The morning patrol on 21 December 2011 extended 3.8km north, commencing from the southernmost point of the GCFR. The starting point of this sub-section has been named Gnaraloo Farquhar South (**GFS**) and ends at the area of rock outcrop just north of the Gnaraloo Farquhar pastoral hut. The end point of this sub-section has been named Gnaraloo Farquhar Hut (**GFH**). Hence, the name of this new Sub-section is GFS – GFH (i.e. Sub-section 1) (refer Map 1).

On 22 December 2011, the morning patrol extended 4.4km north, commencing from the sub-section starting point which has been named Gnaraloo Farquhar Runway (**GFR**) (note: the informal GTCP beach camp area is located nearby). The end point of this sub-section is Gnaraloo Lagoon North (**GLN**). Hence, the name of this new Sub-section is GFR – GLN (i.e. Sub-section 3) (refer Map 1).

Due to the high number of activities found during the patrol on 22 December 2011 from GFR – GLN, the GTCP researchers surveyed GFR – GLN again during the morning patrol of 23 December 2011.

During the morning patrols, in addition to recording data on turtle activities from the immediately preceding night, data of older activities were also recorded when possible (i.e. when the tracks and/or activity were still visible). Night patrols were not conducted nor were any in-water snorkeling surveys.

In lieu of setting up a campsite for the 3 day survey during December 2011, the GTCP researchers camped in the tray of the GTCP 4WD ute at different locations each night. This also allowed the researchers to begin morning monitoring immediately by eliminating the need to travel between a campsite and the different sections of beach being surveyed.

4. Results

4.1 Delineation of sub-sections in GCFR

The newly named GCFR extends from the southernmost boundary of the Cape Farquhar Marine Sanctuary Zone (**MSZ**) of the Ningaloo Marine Park (corresponding to Sub-section point GFS) to the northernmost boundary of the Cape Farquhar MSZ (corresponding to Sub-section point GFN). Refer to Map 1 for an overview of the GCFR and to the travel mud map in *GTCP Monitoring Procedure 2011/12* (Hattingh *et al.*, 2012).

It is possible to walk along the majority of the coast from the southernmost to northernmost point of the GCFR, a distance of approximately 14km. This includes a section of approximately 1.2km of reef rock that is impassible on the beach (refer below).

The December 2011 survey monitored the Sub-sections GFS – GFH and GFR - GLN (refer below).

4.1.1 Gnaraloo Farquhar South (GFS) to Gnaraloo Farquhar Hut (GFH)

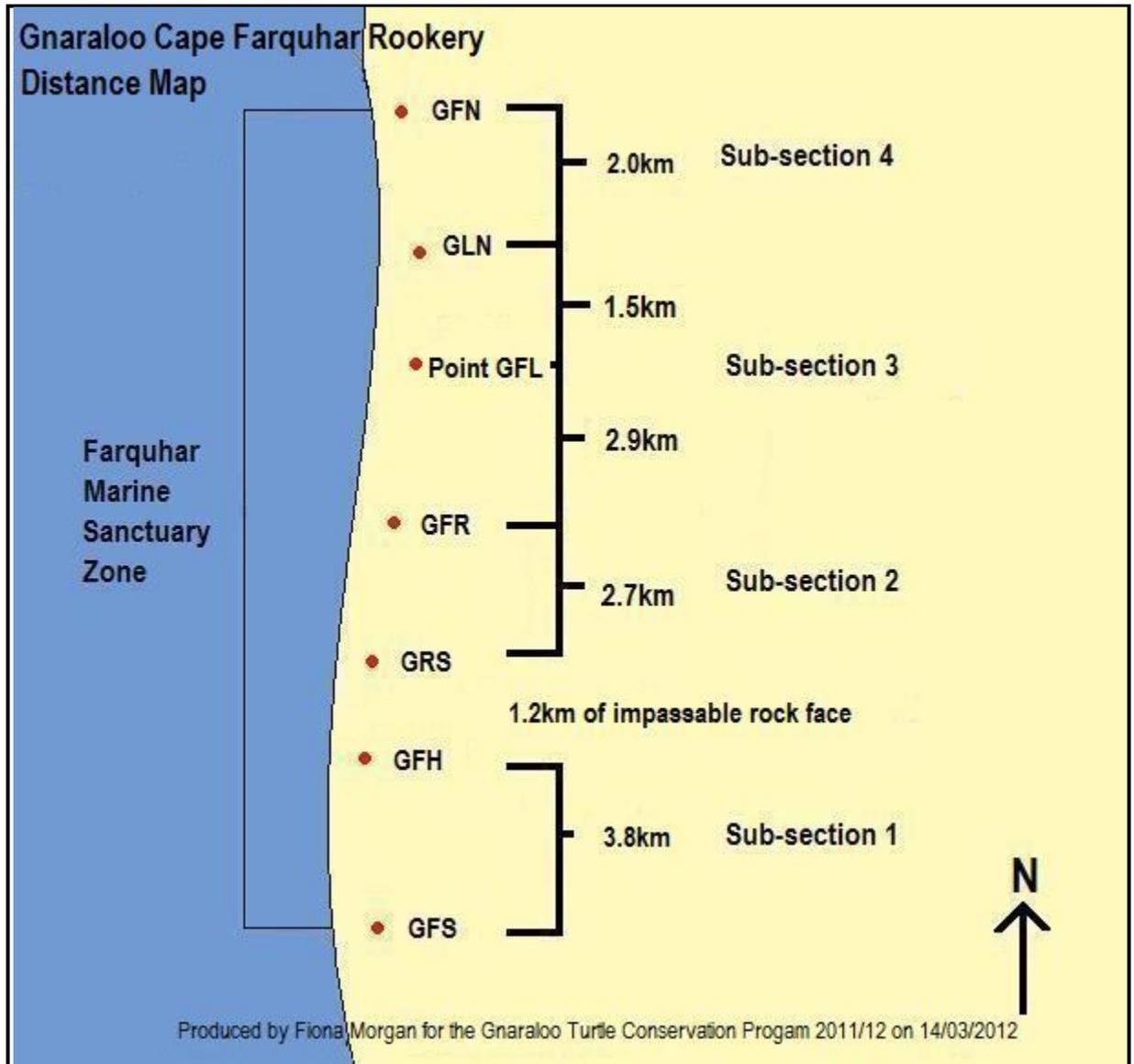
Sub-section GFS – GFH (Sub-section 1) is located between -23.64168/113.61544 and -23.62084/113.63540. Sub-section point GFS is located at the southernmost point of the Cape Farquhar MSZ. Sub-section point GFH is situated slightly north of the Gnaraloo Farquhar pastoral hut at the beginning of an elevated outcrop of reef rock. Sub-section GFS – GFH contains calm beach with reef bordering the shoreline. This section is approximately 3.8km long and can be covered on foot in approximately 45 minutes.

North of Sub-section point GFH there is a section of approximately 1.2km of impassible reef rock to the start of Sub-section point Gnaraloo Runway South (**GRS**).

4.1.2 Gnaraloo Farquhar Runway (GFR) to Gnaraloo Lagoon North (GLN)

Sub-section GFR – GLN (Sub-section 3) is situated northwards of Sub-section GFS – GFH. This Sub-section commences at a section of protruding reef rocks at -23.59641/113.66083 and ends at -23.57697/113.69828. Between GFR – GLN, the beach is made up of low lying vegetation and is fringed completely by shallow reef. This section is approximately 4.4km long and can be travelled on foot in approximately 50 minutes.

Note: this Sub-section includes the coastal area known as the Gnaraloo Farquhar Lagoon. It is approximately 2.9km from GFR to the Gnaraloo Farquhar Lagoon and approximately 1.5km from the Gnaraloo Farquhar Lagoon to GLN.



Map 1: Mud map of Gnaraloo Cape Farquhar Rookery (Season 2011/12)

4.1.3 Other sub-sections

Sub-sections of the GCFR that were not monitored during the December 2011 survey will be patrolled during the further 3-day surveys in January and February 2012 [including Sub-section Gnaraloo Runway South (**GRS**) to Gnaraloo Farquhar Runway (**GFR**) (i.e. Sub-section 2) and Sub-section Gnaraloo Lagoon North (**GLN**) to Gnaraloo Farquhar North (**GFN**) (i.e. Sub-section 4)]. Sub-section point GFN is located at the northernmost point of the Cape Farquhar MSZ.

Note: the current delineation of the GCFR may change in future given further findings during subsequent GTCP seasons.

4.2 Turtle activities

A total of 17 **new** (i.e. occurred the night immediately preceding the morning patrol) turtle activities (including nests, unsuccessful nesting attempts (**UNA**), U-tracks and unidentified activities) were recorded in monitored sub-sections of the GCFR during 21 - 23 December 2011, with the most activities observed in the Sub-section GFR – GLN (Sub-section 3) (refer Table 1 and Map 2).

Of the new turtle activities recorded, all were identified as loggerhead (*Caretta caretta*), with:

- 17 loggerhead;
- 0 green (*Chelonia mydas*); and
- 0 hawksbill turtle (*Eretmochelys imbricata*).

The breakdown of the new activities in the monitored sub-sections of the GCFR included (refer Table 1):

- 8 nests;
- 8 UNAs; and
- 1 U-track.

Table 1: Total new turtle activities recorded at the Gnaraloo Cape Farquhar Rookery (21 – 23 December 2011).

Species	Activity	21 Dec 2011	22 Dec 2011	23 Dec 2011
		Sub-section 1 GFS - GFH	Sub-section 3 GFR - GLN	Sub-section 3 GFR - GLN
Loggerhead (<i>Caretta caretta</i>)	Nest	0	5	3
	UNA	2	4	2
	U-track	0	1	0
	Unidentified*	0	0	0
Green (<i>Chelonia mydas</i>)	Nest	0	0	0
	UNA	0	0	0
	U-track	0	0	0
	Unidentified*	0	0	0
Hawksbill (<i>Eretmochelys imbricata</i>)	Nest	0	0	0
	UNA	0	0	0
	U-track	0	0	0
	Unidentified*	0	0	0
Unidentified species	Nest	0	0	0
	UNA	0	0	0
	U-track	0	0	0
	Unidentified*	0	0	0
TOTAL		2	10	5

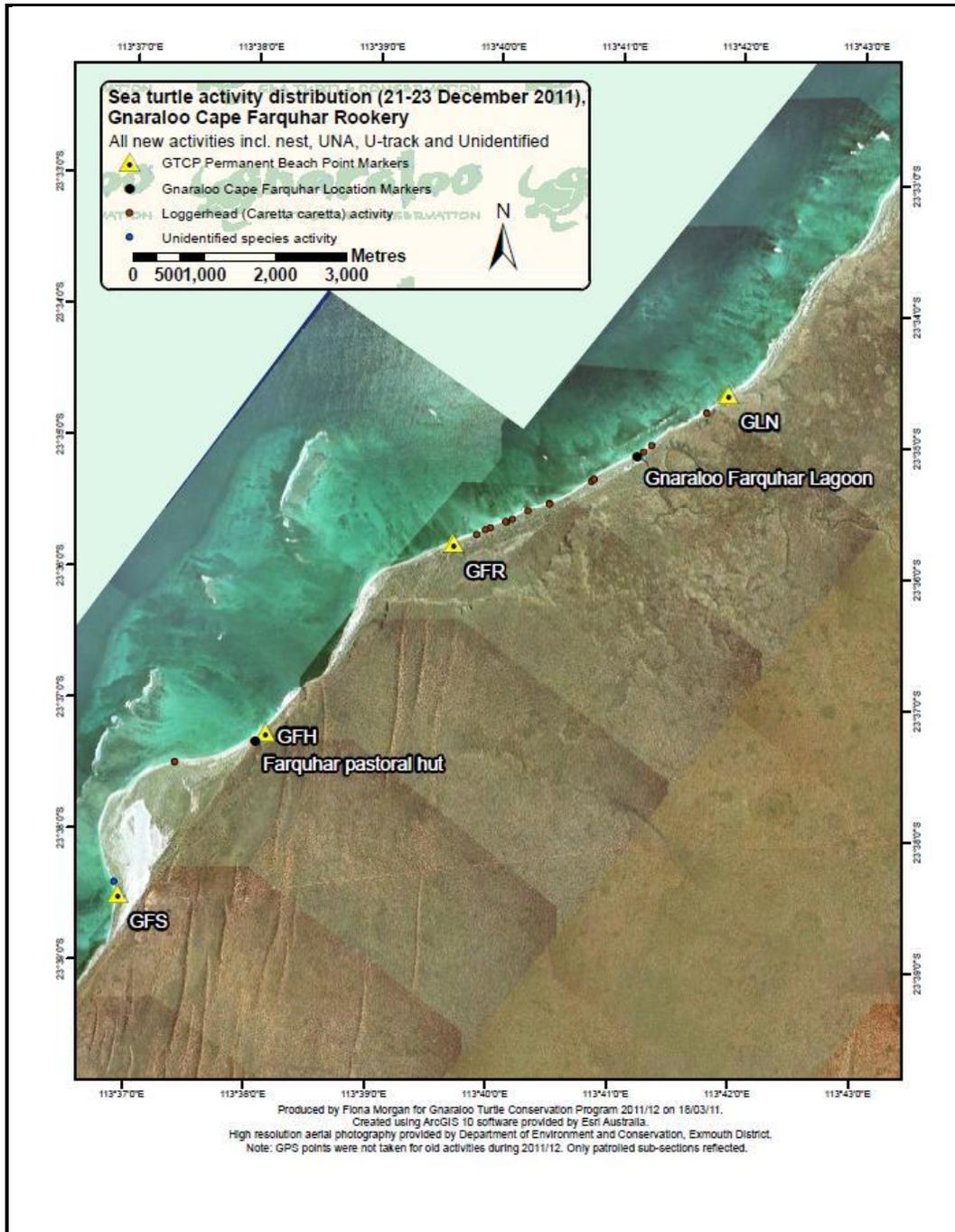
Notes:

* i.e. determination of nest vs UNA could not be made given weathering of the tracks by wind, tides and other environmental conditions.

Refer to Map 2 for the distribution of new sea turtle activities in the GCFR sub-sections patrolled during 21 – 23 December 2011.

In addition to the new turtle activities, 6 **old** activities were observed (i.e. occurred prior to the night immediately preceding the initial morning patrol): 1 in Sub-section GFS – GFH and 5 in Sub-section GFR – GLN. 4 of the 6 old activities were not able to be identified by species due to weathering of tracks by wind, tides and other environmental conditions (the other 2 were loggerheads). Of the 6 old activities, 2 were able to be identified by activity (1 nest and 1 UNA), while the rest remained unidentifiable.

Turtle activities at the Gnaraloo Bay Rookery (**GBR**) during 21 – 23 December 2011 are compared with the new turtle activities at the GCFR in Table 2 below. Concurrent monitoring of the GBR during this period was undertaken by GTCP team member Robert Edman (GTCP Community Volunteer Co-ordinator 2011/12).



Map 2: New sea turtle activities recorded in the monitored sub-sections of the Gnaraloo Cape Farquhar Rookery (21 – 23 December 2011)
(Correction: The unidentified species shown in GFS – GFH was an old activity. Both new activities here were loggerhead)

Table 2: Comparison of total new turtle activities at the Gnaraloo Bay Rookery and the Gnaraloo Cape Farquhar Rookery (21 – 23 December 2011).

Species	Activity	21 – 23 Dec 2011	21 – 23 Dec 2011
		Entire GBR*	Monitored sub-sections of GCFR*
Loggerhead (<i>Caretta caretta</i>)	Nest	13	8
	UNA	5	8
	U-track	13	1
	Unidentified	3	0
Green (<i>Chelonia mydas</i>)	Nest	2	0
	UNA	1	0
	U-Track	0	0
	Unidentified	1	0
Hawksbill (<i>Eretmochelys imbricata</i>)	Nest	0	0
	UNA	0	0
	U-Track	0	0
	Unidentified	0	0
Unidentified species	Nest	0	0
	UNA	0	0
	U-Track	0	0
	Unidentified	0	0
TOTALS		38	17

Notes:

* GBR included Sub-sections GBN – BP9. GCFR included Sub-sections GFS – GFH (Sub-section 1) and GFR – GLN (Sub-section 3).

5. Discussion

The number of new turtle activities observed in the GCFR was slightly less than that recorded in the GBR during 21 – 23 December 2011. Turtle activities were most frequent in the Sub-section GFR – GLN (Sub-section 3) and entirely loggerhead among tracks that were able to be identified.

Though no green turtle activities were positively identified, the team did observe several large turtles swimming alongshore in the vicinity of GFR – GLN (likely greens) and several smaller, unidentified individuals swimming in both Sub-section GFS – GFH (Sub-section 1) and Sub-section GFR – GLN (likely greens or possibly hawksbills). This indicates that the loggerhead tracks observed may not entirely describe the extent of turtle presence in the area by other species.

Considering that the first on-ground survey of the GCFR occurred before the seasonal peak for nesting in the GBR (determined to be around 10 January), it is possible that nest activities in the GCFR had not yet reached its peak at the time of the monitoring survey during December 2011. If this is the case, the results of the first GCFR survey may be an underestimate of the frequency of nest activities in the GCFR during the entire nesting period. A trend would be better assessed after the conclusion of the second and third surveys of the GCFR during January and February 2012.

Given the considerations listed above, as the GCFR may support a significant population of nesting loggerheads and possible mating, nesting, foraging and/or resting grounds for other species, the investment in continued monitoring efforts is justified.

6. Recommendations

6.1. Scope of research

It is recommended that monitoring activities of the GCFR be restricted to day time beach patrols, particularly within the Sub-section GFR – GLN (Sub-section 3). Night time patrols to confirm data accuracy are considered unnecessary at this stage as all GTCP researchers have achieved an acceptable level of accuracy for species and nest activity identification given their intensive survey work in the GBR since November 2011. Similarly, the in-water snorkeling surveys that were originally proposed may be considered an additional activity, if time allows then snorkeling may be undertaken.

6.2. Preparation for survey work

Accessing the GCFR requires a dependable 4WD vehicle and the ability to successfully address any unforeseen difficulties without assistance (for example, flat tyres, sand bogs, personal injuries). During the course of the December 2011 survey, the GTCP researchers encountered a flat tyre and one significant bogging incident. Since the GCFR is remote and outside the range of UHF radio contact, it is of utmost importance that researchers do not leave the Gnaraloo Homestead without giving notice to Gnaraloo staff and being completely prepared for all possible challenges and eventualities.

The GCFR surveys are not to be treated lightly as poor preparation could place the researchers in possibly life-threatening situations. Critical equipment includes a wheel brace, jack, spare tyre, air compressor, at least 25L of water, 5 days worth of food, a first aid kit (including compression bandages to treat snake bites), tarpaulin for shade, ropes, at least 1 shovel and a two-way radio.

6.3. Installation of permanent sub-section markers

To easily identify the boundaries of the GCFR Study Area 2011/12, it is recommended that permanent sub-section markers be installed at each of the stated sub-sections. As there is a possibility of adjusting the sub-sections to reflect the results of the further 2 scheduled surveys during 2011/12, installation of permanent sub-section markers should take place during the final survey in February 2012.

However, for the upcoming GCFR survey during January 2012, it is recommended that semi-permanent markers (wooden stakes) be installed as a first step towards formalizing the boundaries of the monitored area.

6.3. Campsite accommodation during January 2012

Since the GCFR is still being explored and monitoring efforts are not yet concentrated in particular areas, it would be best not to make camp at one fixed location and instead sleep in swags on the tray of the GTCP ute. This would ensure that the GTCP researchers are as close as possible at first light to the various study sites and do not have to commute in the morning from the campsite to the areas being monitored. Additionally, sleeping in the GTCP ute provides added protection from hazards such as snakes and other animals. When the GCFR study area is formalized in future, it would be beneficial to choose a campsite that is centrally located to the targeted sub-sections.

7. Conclusions

The December 2011 survey of the GCFR took place prior to the assumed seasonal peak for sea turtle nesting at Gnaraloo, determined to be around 10 January based on results at the GBR since 2008/09. Taking this into account, it is believed that at the time of the next GCFR survey during January 2012, turtle activity will have increased in accordance with the nesting trends previously observed at the GBR.

New turtle activities recorded during the first on-ground survey of the GCFR in December 2011 was slightly less than that recorded during the same period at the GBR. Sub-section GFS – GFH (Sub-section 1) was the area of least activity and will not be re-surveyed during January and February 2012 as the busier Sub-section GFR – GFN (Sub-section 3) justifies greater surveying. The other two sub-sections of the GCFR immediately south and north of Sub-section GFR – GLN that have not yet been monitored will be surveyed during January 2012.

Of all the activities recorded during the first reconnaissance survey of the GCFR, only loggerhead tracks were positively identified, suggesting that loggerhead turtles are the most prevalent in the GCFR, as is the case in the regularly monitored GBR. Green turtles were observed swimming offshore, although most appeared to be of juvenile size and as such would not come onshore to nest.