Sea Turtle Monitoring and Research

Report 2010

Pacuare Nature Reserve

Photograph: Estrella Tapias Gonzalez

Program for conservation of sea turtles on the Caribbean coast of Costa Rica.

Report of the activities of monitoring project of the nesting of Leatherback, Green and Hawksbill sea turtles in the Pacuare Reserve, Costa Rica.

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Thankyou for the valuable contributions that made 2010 a successful season in Pacuare Nature Reserve

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SUMMARY TABLE

	Leatherback	Green	Hawksbill
Total number of events (nests + false crawls)	1269	215	19
Number of nests	899	99	9
Number of false crawls	760	116	10
Number of recorded females	473	38	5
Number of females tagged externally	208	32	5
Number of females PIT tagged (internal)	126	-	-
Number of remigrating females	362	6	0
Number of neophytes	111	32	5
Number of renesting females (>1 nest)	206	1	1
Average CCL (cm)	150.4	104.4	85.0
Average CCW (cm)	109.5	93.4	76.5
Number of natural nests	227	54	4
Number of relocated nests	394	4	1
Number of unknown nests	278	41	4
Number of fertile eggs counted	40837	3133	302
Number of infertile eggs	12304	1	-
Success rate of relocated nests (%)	61.8	-	-
Success rate of natural nests (%)	57.9	67.7	88.5
Estimated number of hatchlings	40080	-	-

1. Introduction

1.1. Sea turtle species

The sea turtle is a highly migratory reptile, with slow development (reaching sexual maturity after at least 10 years), high mortality in the early stages of development, and reliance on various marine ecosystems such as reefs and deep ocean habitats throughout its life cycle. There are seven species of sea turtle, with one highly discussed sub-species. 4 of these species are known to nest on the Caribbean coast of Costa Rica: *Dermochelys coriacea* (Leatherback), *Chelonia mydas* (Green), *Eretmochelys imbricata* (Hawksbill) and *Caretta caretta* (Loggerhead). The species that nests in the greatest abundance in the Pacuare Nature Reserve (PNR) is the Leatherback sea turtle. Around the world sea turtles have become endangered as an adverse consequence of human activity, especially hunting for shell and meat, harvesting of eggs, and incidental capture in fishing gear (Tisdell & Wilson, 2002). Global conservation efforts are aimed at protecting and conserving sea turtle populations in both nesting and foraging areas.

1.1.1. Leatherback sea turtle

The leatherback sea turtle, *D. coriacea*, is among the largest known reptiles, with adults weighing approximately 1000kg. Classified as critically endangered on the IUCN Red List (2003), they are the most widely distributed of all sea turtle species, found in almost all of the world's oceans with the exception of the Arctic and the Antarctic (Reina et al. 2002). The large body size, control of blood flow, and effective insulation allow leatherbacks to inhabit cold water and to dive to great depths. However, nesting is limited to tropical and sub-tropical regions, as with other species of sea turtle.

Figure 1: Adult female leatherback sea turtle nesting in the Pacuare Nature Reserve, May 2010.

The leatherback is the only surviving member of the family Dermochelyidae. The most striking difference between leatherbacks and other sea turtle species, the Chelonidae family, is the shell. Leatherbacks have a thick leathery skin covering a matrix of small bones. The carapace has seven distinct lateral ridges and tapers in a 'teardrop' shape to the peduncle. The body is black in colour, appearing sometimes blue in the light, with irregularly patterned white spots. They possess an upper mandible with two projections, as visible in figure one. On top of the head is a pink spot, thought to be used for navigation, which is unique to each turtle and can be used in the same manner as a fingerprint in order to identify the turtle. They have strong front flippers that easily extend half the length of the turtle's body, allowing them to reach swimming speeds of over 5 miles per hour. The deepest recorded dive of a leatherback is 1230 metres in the North Atlantic ocean. Females prefer to nest on high energy beaches with strong currents, steep approaches and lacking in obstacles such as coral reefs.

Chacon & Eckert (2007) reported that nesting female leatherback sea turtles in the Caribbean have an average curved carapace length of 154.65cm and a average curved carapace width of 112.83cm. The largest recorded leatherback was found off the coast of Wales, UK, weighing 916kg and with a length of over 3 metres. The average number for a clutch of eggs, for leatherbacks in Costa Rica, was calculated as 82 with 30 'vanos' or infertile eggs. Incubation time is typically between 50 and 70 days (Chacón & Eckert, 2001).

Troëng et al. (2004) estimated that 70% of the leatherback sea turtles that nest in the Caribbean zone of Costa Rica converge in the protected areas of the Pacuare Nature Reserve, Tortuguero National Park, the Gandoca-Manzanillo Wildlife Refuge, and Cahuita National Park. They suggested that between 500 and 1000 females per year nest in the zone, making it the third largest nesting zone for leatherbacks in the Caribbean. The status of leatherbacks depends greatly on the particular population. Pacific leatherbacks are thought to be in decline, and may reach extinction in the near future. Status of Caribbean leatherbacks has been the subject of debate. It is thought that extensive conservation efforts, in countries such as Costa Rica, may be leading to a positive trend in leatherback numbers.

1.1.2. Green sea turtle

The green sea turtle, *C. mydas*, of the family Chelonidae, has been historically exploited throughout the Caribbean. The species is classified as endangered on the IUCN Red List (2003). Tortuguero, north of Pacuare Nature reserve, hosts the largest remaining green turtle rookery in the Atlantic basin (Troëng & Rankin, 2005), where monitoring began in 1955 with the work of Archie Carr. Troëng & Rankin (2005) also suggested that Caribbean greens are showing signs of recuperation, although it is clear that illegal hunting is still problematic in this area. Green turtles are primarily hunted for their meat, which has been consumed locally throughout history and forms a part of the indigenous culture.

Adult green sea turtles are vegetarian, feeding primarily on the seagrass beds found in tropical shallow areas. They are often found in coral reef areas where they are known to graze on algae, making them an integral part of the coral reed ecosystem. Extensive debate is centred around the possible misclassification of the Pacific green, or black, sea turtle (*Chelonia Mydas Agassizii*) as a sub-species of the green turtle. It has been suggested that rather than a sub-species, the black turtle is another distinct species.

Figure 2: Example of adult female green sea turtle.

The average curved carapace length of green sea turtles is 104.6cm, with an average clutch size of 112 eggs (Chacon et al. 2007). The renesting interval is 12 days, with each female laying approximately 3 nests per season. Green sea turtle nesting beaches are typically open beaches with sloping approaches and minimal disturbance. They have strong nesting site fidelity, to a greater extent than the leatherback sea turtles, and make long distance migrations between feeding grounds and nesting beaches. Many tracking studies of such migrations have been carried out using satellite transmitters e.g. Luschi et al. 1998.

An increasingly common problem in green sea turtles is fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs. Although currently infrequent in the Caribbean, the tumors may interfere with swimming, eating, breathing, vision, and reproduction.

1.1.3. Hawksbill sea turtle

The hawksbill sea turtle, *E. imbricata*, of the family Chelonidae, is easily distinguished by the pointed beak of its upper mandible, and for the serrated edges and overlapping scutes of the carapace (figure 3). The hawksbill spends much of its life in the open ocean but is also frequently found in the shallow waters of coral and rocky reefs. They feed primarily on sponges, and have a

digestive system specialized for their diet. A normal digestive system is unable to digest the spicules that comprise sponges. Hawksbills are the most endangered species of sea turtles, listed as critically endangered by the International Union for Conservation of Nature and Natural Resources (IUCN) (www.redlist.org). The massive decline in numbers of hawksbill sea turtle populations is attributed to the hunting of this species for their beautiful and highly coveted carapace. Although international trade is now illegal, it is easy to find artesania made from hawksbill shell such as rings, bracelets and necklaces.

Figure 3: Example of hawksbill sea turtle in a coral reef hábitat.

The average curved carapace length of hawksbill sea turtles in Costa Rica is 85.97cm. They nest an average of 5 times per season, with a renesting interval of between 14 and 16 days. A hawksbill nests every 2 to 3 years. The average clutch size of a hawksbill sea turtle is 155 eggs (Chacon et al., 2007).

1.2. Threats

Although sea turtles are protected by national and international legislation (see Campbell (1998) for an overview of marine turtle legislation in Costa Rica), the occurrence of illegal hunting and egg removal from nesting beaches is a prominent threat to the conservation of populations, particularly in countries such as Costa Rica. Hunting of sea turtles and consumption of their eggs is deep-seated in the culture of Costa Rica. The introduction of restrictions to facilitate the preservation of decreasing populations of sea turtles undoubtedly leads to conflict between those who utilise them as a source of nutrition, and others who are active in their conservation. As tourism in Costa Rica increases, the value of wildlife populations alters as a consequence. It is possible that the importance of sea turtles is shifting from use as a consumptive, nutritional resource, to a non-consumptive resource attracting large numbers of tourists to otherwise unvisited locations.

However, individuals unable to become involved in the tourism industry may resort to poaching as a source of income, particularly if there remains a demand for prohibited products.

Leatherback sea turtles have traditionally been killed as a resource for local communities. They have oily flesh and bones, meaning that they are not often killed for meat consumption. However, illegal harvest of eggs is common practise throughout the tropics as they are believed to be an aphrodisiac. This deep-seated cultural practise has undoubtedly contributed to the decline of leatherback populations. Hawksbill sea turtles are typically exploited for their attractive shell (see Figure 30 for an example of a hawksbill sea turtle in Pacuare Nature Reserve found without a carapace). Green turtle are hunted for their meat, which has become expensive and therefore more valuable since restrictions have been imposed on the capture and sale of turtle products.

Other threats to all sea turtle species include loss or degradation of nesting habitat from coastal development, disorientation of hatchlings by beachfront lighting, nest predation by native, invasive and domestic predators, degradation of foraging habitat such as coral reeks and seagrass beds, pollution of marine ecosystems, and incidental capture by commercial fisheries.

Natural threats also exist to sea turtle populations. Erosion of the coastal zone is becoming a more prominent threat to nesting sea turtles, with extensive beach erosion and subsequent loss of beach resulting in reduced nesting environment and the loss of many nests. This, in turn, reduces the hatching success of the region. Sea level rise may also contribute to a loss of suitable nesting habitat. Furthermore, it is important to consider the potential impact of global temperature rise on sea turtle populations. Gender of sea turtle embryos is determined by temperature during certain stages of development i.e. above the pivotal temperature hatchlings will be female, and below the pivotal temperature they will be male. The implications of global temperature rise are a resulting increase in the proportion of females in the sea turtle population. This will alter the balance of the population and has potential consequences for genetic diversity.

2. Methods

2.1. Study Site

The Pacuare Nature Reserve (PNR) is located along the northern Caribbean coast of Costa Rica, bordered to the north by the Pacuare rivermouth and to the south by the Mondonguillo lagoon. PNR is 30km NW of the port of Limón and 45km south of Tortuguero. This area of the coast is characterized by dynamic sandy beaches with medium to steep slopes and the surf is generally strong. These beaches have formed by an accumulation of sediments brought down by rivers (along with organic and inorganic debris such as logs and waste from banana plantations) which are distributed along the coast by tides and currents. The beaches consist of sand of volcanic origin,

giving them their black colour, containing virtually no organic matter such as shells or corals. Some of the particles found in the black sand, such as magnetite, are magnetic.

Figure 4: Map of the PNR: (a) location of the PNR in Costa Rica, (b) location of the PNR in relation to the canals and Caribbean coast.

PNR contains 800 hectares of land and 6 km of beach which was originally purchased in 1989 by a British Charitable Trust, the Endangered Wildlife Trust, in order to allow natural regeneration of the tropical lowland forest. Transport into the reserve is limited to boat access through a system of natural and man-made canals. The natural canals were connected in the 1970s in order to facilitate the logging industry in the region. They are now used as a drainage system for the surrounding banana plantations.

The sea turtle monitoring project operates on the 6km of beach located within PNR (Figure 4). Two stations, one at the northern and one at the southern limit of the reserve, are fully operational throughout the monitoring season.

2.2. Monitoring Period

The sea turtle monitoring, research and education program at PNR operated between March 1st 2010 until September 25th 2010, with additional data collected between October 1st 2010 and October 30th 2010. Project coordinators arrive at PNR 1 week prior to the beginning of the monitoring period in order to prepare the stations for operation.

2.3. Methodology

The work protocol at the PNR follows the methods detailed in the SINAC "Manual for management and conservation of sea turtles in Costa Rica: with emphasis on the operation of beach projects and hatcheries" (Chacon et al, 2007).

2.3.1. Preparation of Beach

The beach is monitored from stations at the North and South ends of the 5.7km beach. Between the two stations, marker posts divide the beach into 100m sectors. Each 100m is then divided into 25m sectors. For example, between sector 1 and 2 can be found sector posts 1.1, 1.2 and 1.3. Sector posts are marked using either wooden panels fixed in the berm of the beach, or directly painted on large trees at the appropriate distance for each sector. The background is painted with white oil-based paint and the numbers in black oil-based paint. Posts also have a nail placed in the centre of a black cross to enable accurate triangulation of sea turtle nests. Post 0 is located in line with the middle of the Mondonguillo lagoon at the south station and marks the boundary at which PNR meets the project "Estación Las Tortugas" to the south. The beach was divided into two sectors for monitoring: the south from sector 0 to 35, and the north from sector 35 to 57. The beach was divided in this manner based on nesting density at different points of the beach throughout previous seasons, in order to maximize the number of turtles encountered during patrols.

2.3.2. Patrolling

Work methods employed during patrols are followed, and in some instances slightly adapted, from the SINAC "Manual for management and conservation of sea turtles in Costa Rica: with emphasis on the operation of beach projects and hatcheries" (Chacon et al, 2007). One major addition to the protocol was the camouflaging of all sea turtle activity on the beach. All tracks and nests are erased as a means to reduce poaching in the PNR. It has been stated in previous seasons that poachers tend to gain access to the beach by boat, stopping at locations where there is a density of tracks and nests. If all nesting evidence is erased, poachers have no knowledge of the most beneficial places to approach the beach.

Patrols were organized in a manner that ensured there was a continuous presence on the beach between 8pm and 4am every day. The schedule for patrols was flexible and varied throughout the season according to the number of research assistants, volunteers and student groups present. Patrols were also adjusted in response to varying numbers of turtles visiting the beach. A minimum of two patrols per night were scheduled during the leatherback season, with a maximum of four patrols per night. Patrols would leave every one or 2 hours in order to increase the possibility of encountering a nesting sea turtle, and to ensure a constant presence on the beach to reduce the possibility of illegal nest removal by poachers.

During the peak of the nightly nesting, it was always important to have at least two patrols in each half of the beach. During the peak of the season it is common for one patrol to get caught in one area of the beach e.g. between sectors 30 and 35, with a large number of turtles. Having more than one patrol active ensures greater coverage of the beach and a higher encounter rate of nesting females. Beach patrols were led by either a project coordinator or research assistant, accompanied by student groups, volunteers or tourists. Throughout the peak season, each patrol had a minimum

of 2 people. If the patrol comprised only two members, ideally these would be two research assistants meaning that multiple turtles could be worked effectively at the same time. During high nesting intensity periods, patrols frequently extended beyond the four hour period scheduled as patrol leaders were unable to leave a nesting sea turtle.

Daytime patrols were also scheduled daily on the beach in order to confirm all nesting activity during the previous night. New nesting activity were recorded and camouflaged. During the later part of the season, morning census was also used to identify any newly hatched nests that had not been noted the previous night. Exhumations may also be carried out during morning census.

The PNR guards patrolled independently of the sea turtle project patrols in order to maximize beach coverage and beach protection. Guards were present on the beach approximately 20 hours per day, although this time also varied dependent on availability of guards, nesting of sea turtles, and occurrence of unscheduled presence of people in the area. Guards were supportive of the PNR turtle patrols, and frequently alerted patrols to the presence of nesting turtles through the use of previously agreed upon light signals, and radio contact. If the patrol was unable to reach the turtle before oviposition was completed, guards often placed a stick at the exact location of the egg chamber so that eggs could be located and relocated if in a poor position, or accurately triangulated if in a good position on the beach. On numerous occasions guards collected tag numbers from turtles they encountered on the beach, recording their activity and passing the information on to project coordinators.

2.3.3. Training and Preparation of Research Assistants and Volunteers

All of the participants in the project: volunteers, local and international research assistants, received training about the techniques of conservation and management of sea turtles in Costa Rica, and more specifically the PNR. Initial training was given to research assistants at the start of the season in the PNR by project coordinators in order to facilitate the effective start of data collection. The following week, Didiher Chacón from WIDECAST carried out a practical and technical training course over a three day period at a neighbouring project, ensuring research assistants were trained to the appropriate standard, and standardizing protocol and data collection techniques throughout the season.

All volunteers, groups and tourists that came to the PNR were giving training regarding beach patrols, relevant aspects of sea turtle biology, and sea turtle conservation in Costa Rica. Aspects discussed included threats to sea turtles at local and global levels, and the future of sea turtle species.

3. Leatherback Sea Turtle Nesting Season Results

3.1. Nesting Activity

The first recorded nesting activity of leatherback sea turtles (*D. coriacea*) in PNR was 3rd March, indicating the start of the nesting season for 2010. Activities were recorded until 19th July, marking the close of the leatherback nesting season.

899 nests and 370 false crawls were counted, making a total of 1269 registered leatherback events for the 2010 season. Data used to generate Figure 6 is consistent with the data used in the 2009 nesting report. Although the total number of nests is considerably lower than that in 2009, it is higher than the average number of nests per year (yearly mean = 617 nests) based on annual data collected by EWT. The trend-line shows that the number of nests in the PNR is steadily increasing (R^2= 0.2554, exponential function) (figure 6). The nesting figures for PNR appear, from this graph, to show a stable, if not slightly increasing, trend throughout the years since 1994. The figures for both 2009 and 2010 are considerably higher than that of all previous years, with the exception of 1997. If, as suggested by Handy & Lucas in the 2009 report, 2010 is the beginning of a new 4-year nesting cycle, the data presented here indicate an increase in the nesting population. Data collected in the following years will be crucial to confirming or dismissing this theory.

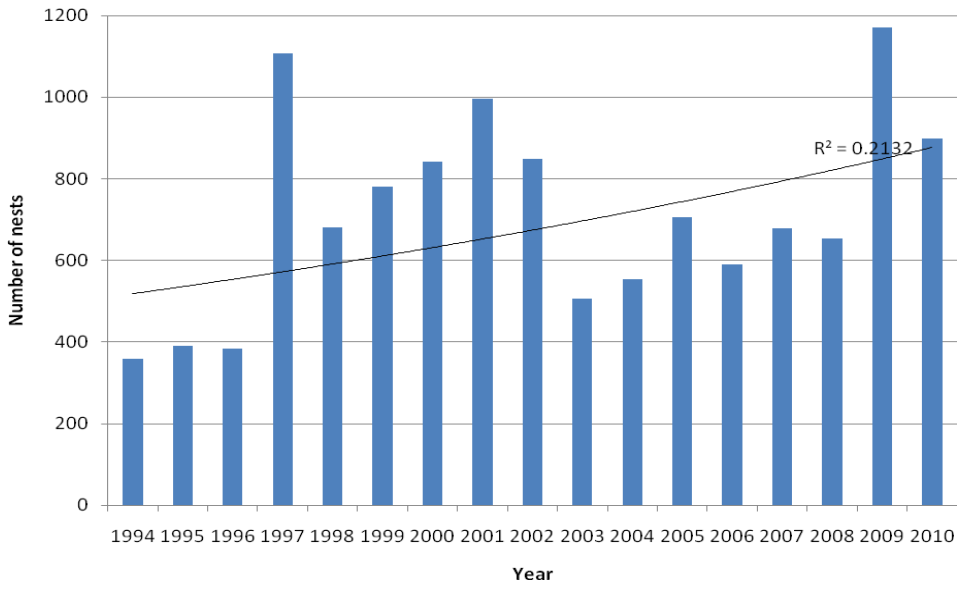

Figure 5: Bar chart representing annual nesting figures for D. coriacea between 1994 and 2010.

The nesting of leatherbacks constitutes 89.4% of the total sea turtle nesting during the study period. Nesting of green sea turtles (*C. mydas*) makes up 9.8%, and hawksbill (*E. imbricata*) nesting just 0.8% (figure 7).

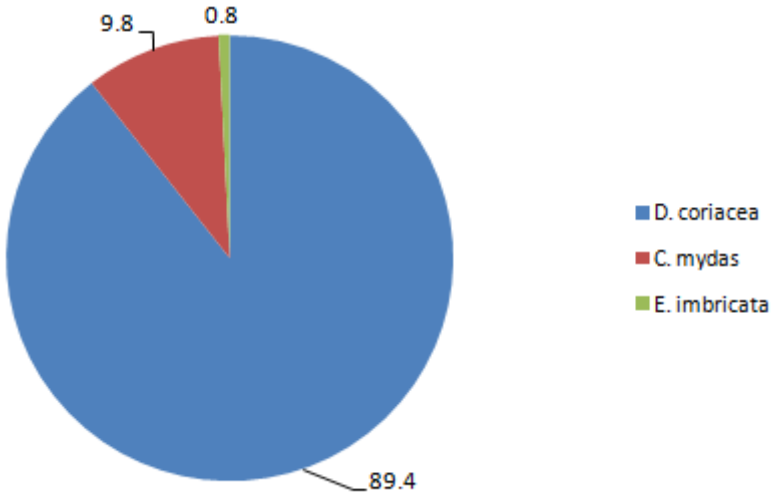

Figure 6: Pie chart indicating percentage of overall nest number for each of the three sea turtle species nesting in PNR.

The poaching rate this year was brought down to less than 1% due to the continued efforts of the PNR guards, coordinators and research assistants. There was only one poaching event that resulted in the loss of nests, with just two nests taken.

3.2. Distribution of Nesting

3.2.1. Temporal distribution of nesting events

The nesting of the leatherback sea turtle occurs throughout the months between March and July, with the peak of nesting intensity in April (37.7%, n=342) and May (36.6%, n=332). This distribution follows the established patterns recognized for the species in this region of the western Caribbean, demonstrating peaks in April and May (Chacón, 1999). This data is comparable to that of 2009, with similar percentages of nests in each month of the season (figure 8). In previous years, the peak nesting density has been reported in May. However, the data from both 2009 and 2010 find the peak in April.

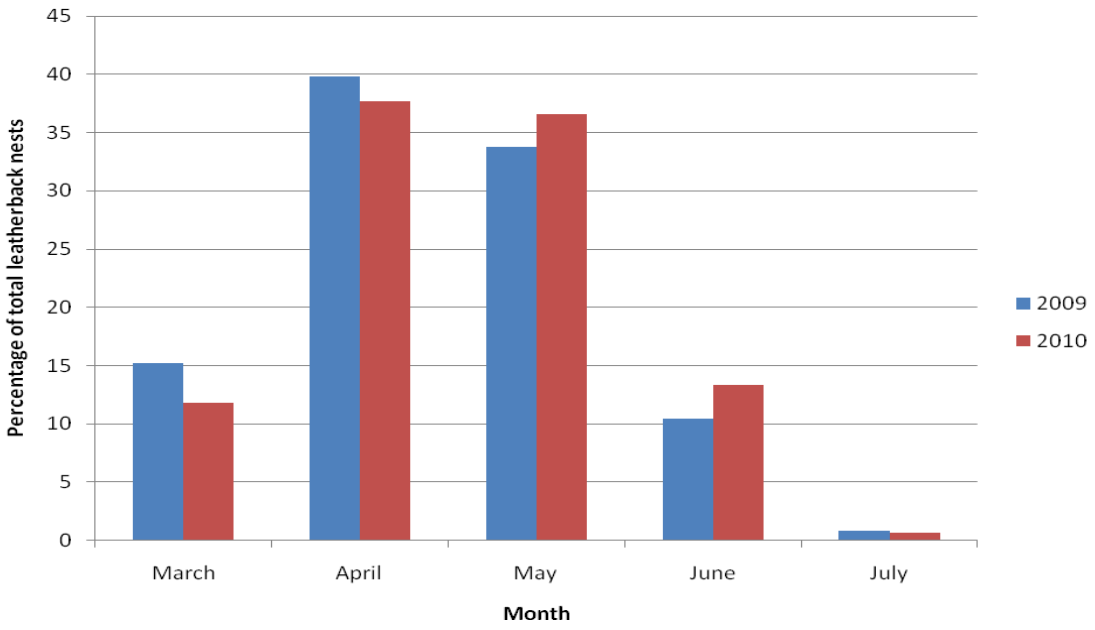

Figure 7: Distribution of the nesting events of *D. coriacea* during the monitoring period, between March and July, for the 2009 and 2010 seasons

It can be observed that nesting of leatherback sea turtles is not at one consistent level throughout the duration of the season. Figure 9 shows the peaks of nesting, with the greatest number of nests in one day (27 nests) at the end of April. Figures 8 and 9 show that the majority of nesting occurs during April and May. However, nesting density during these months is not uniform and there was a clear peak at the end of April, with a second, smaller peak at the end of May. A similar pattern was shown in the 2009 season.

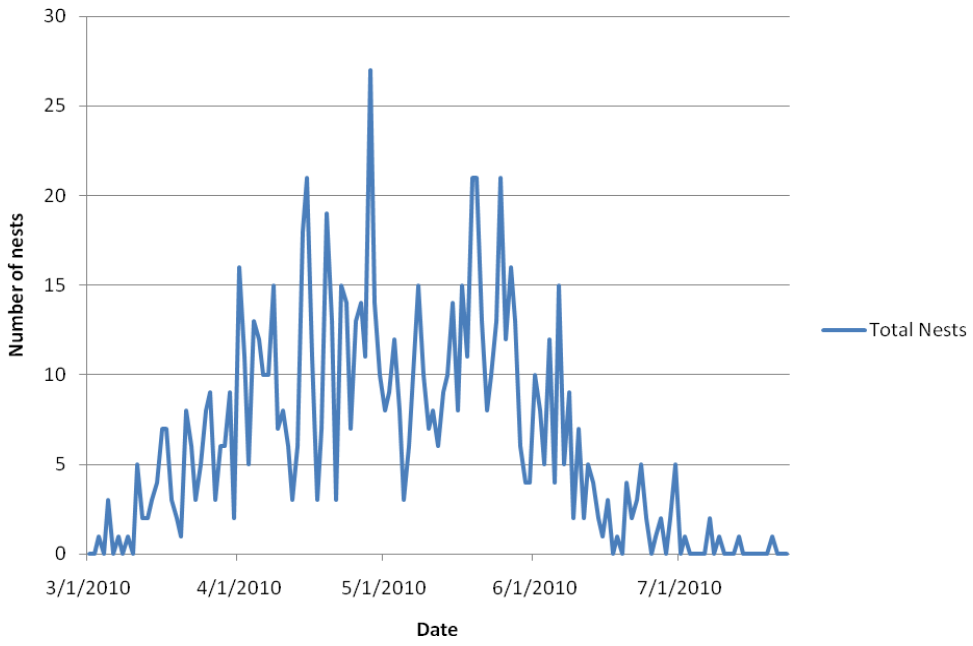

Figure 8: Daily distribution of D.coriacea nesting during the 2010 season at PNR.

These results are important to sea turtle conservation as it allows the construction of effective conservation strategies, indicating the months in which it is important to have increased staff and volunteers available to work the high numbers of nesting activities.

3.2.2. Hourly distribution of nesting events

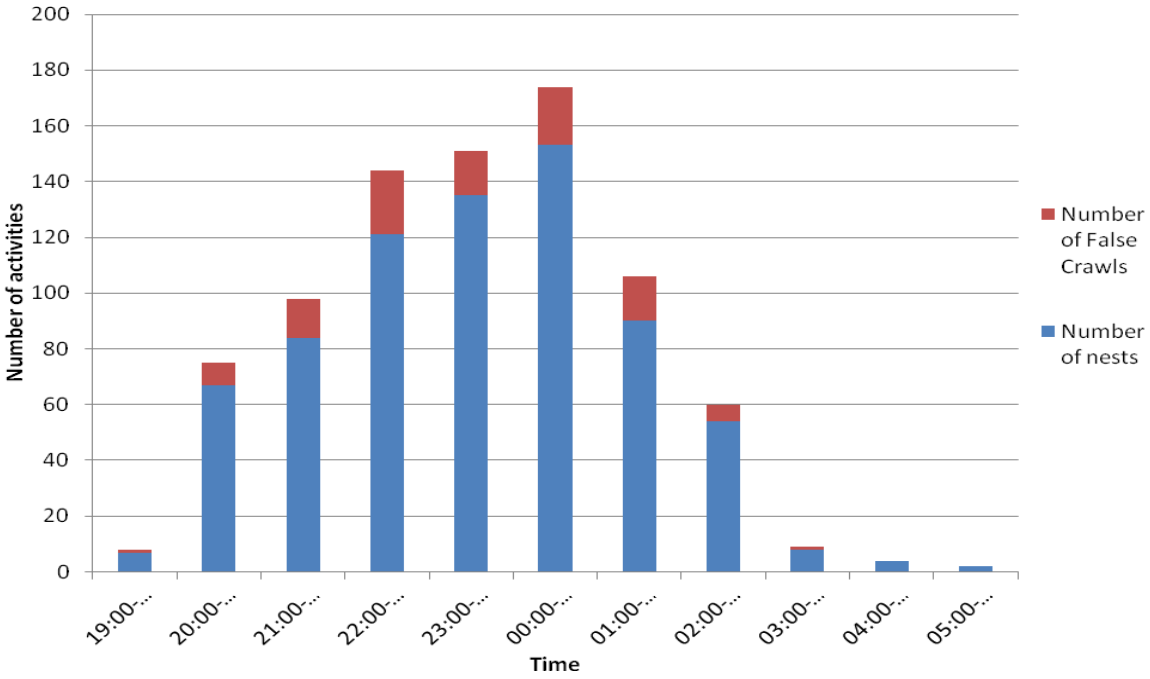

Figure 9: Emergence times of *D. coriacea* during the 2010 nesting season

It can be seen from figure 10 that the peaks of activity occur between 10pm and 1am at PNR. Daytime emergences of leatherback sea turtles are rare but occurred on 2 occasions during the season.

The analysis of the hourly distribution of emergence times of sea turtles allows for more effective organization of the schedule by which personnel work on the beach, in order to increase the likelihood of encountering turtles during nesting events and to work with the maximum possible number of turtles. During the season, patrols worked with 71% of registered emergence events, and 69.4% (n=621) of nests. When nesting density is so high, as in PNR during peak season, it can be difficult to work with all turtles that visit the beach. Hourly distribution combined with spatial distribution of nesting events can be extremely informative when designing patrol schedules and protocols, in order to increase encounter rates.

3.2.3. Spatial distribution of nesting events

Nesting activity was distributed unevenly along the 5.7km of monitored beach. As in 2009, there was a peak of nesting activity at sector zero. The peak is higher this year, which may be attributed to the high erosion that occurred in this area at the beginning of the 2009 season, possibly reducing the number of nests.

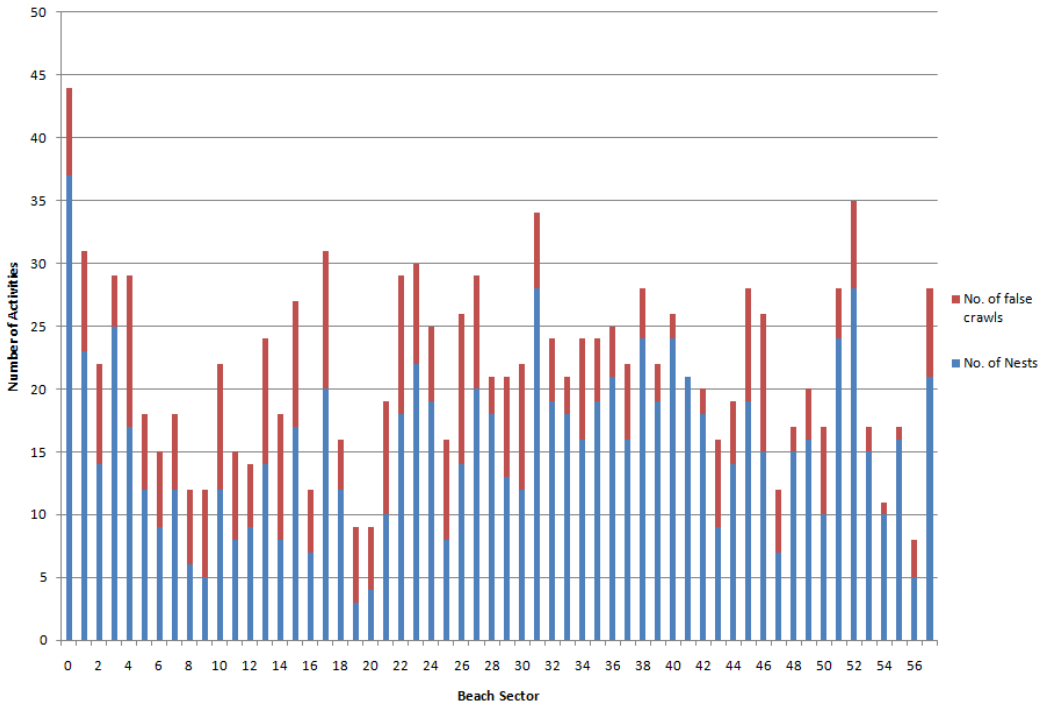

Figure 10: Distribution of the nesting activites of *D. coriacea* between sectors 0 and 57 of the PNR.

The most favoured sectors for oviposition were similar to previous seasons, between sectors 26 and 42, with a total of 320 nests (36%). Distinct areas in which nesting was low include sectors 6 to 9 and 17 to 21, where there were continuous areas of erosion and narrow beach throughout the season. Nesting was also low between sectors 53 and 55. Investigation of the factors that influence nest site selection by nesting females may determine why conditions either drive or reduce nesting at certain sectors on the beach.

Where the proportion of nests left 'in situ' i.e. in their natural position on the beach, is high, the number of relocated nests in that sector is usually low, as shown in figure 12. This indicates that certain sectors had characteristics that meant nests were relocated to more suitable sectors, whereas others were deemed to be of an appropriate standard for nests to be left in situ. For example, it can be seen that between sectors 0 and 3, only 4 nests were left in the location selected by the nesting turtle. This is due to a high water table in this area of beach related to the proximity of the Mondonguillo lagoon, which ultimately reduces the hatching success of nests in the area. Nests located in the middle of the beach also have a high relocation rate. This area is the greatest distance from PNR stations leaving them at greatest risk to poaching activity. A higher proportion of

these nests are relocated in order to disguise the nests from poachers, making the nests less vulnerable. It should also be noted that a higher proportion of nests were left in situ in the north station, whereas in the south station more were relocated. This difference is attributed to differences in the techniques of the coordinators at each station. Figure 12 also highlights the areas in which the most nests were laid without being witnessed by a patrol.

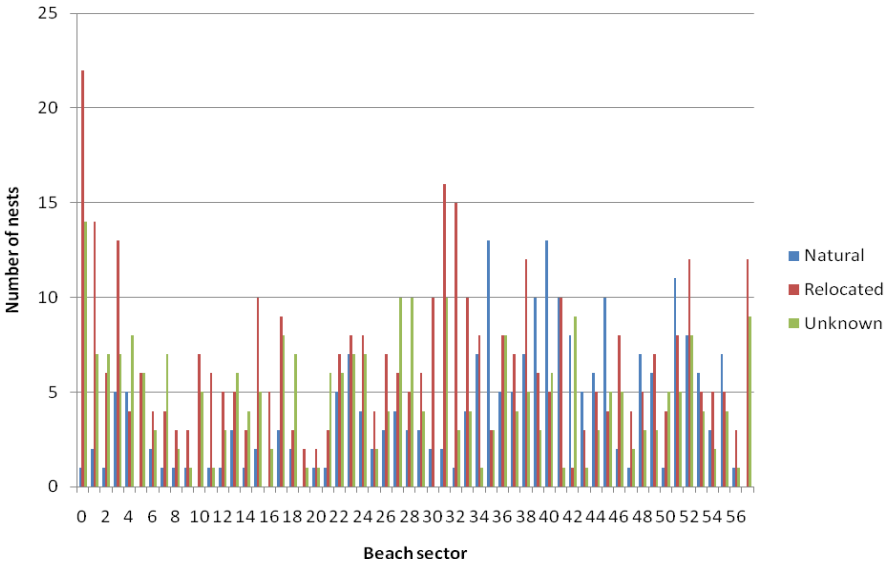

Figure 11: Distribution of different classification of nests in each beach sector in PNR.

The majority of nesting activities take place in the zone 'alta', meaning above the high tide but below the berm at the top of the beach (figure 13). This is recognized as the preferred location for nesting of leatherback sea turtles. Interestingly, the greatest proportion of false crawls i.e. sea turtle emergences that do not result in oviposition, occur below the high tide line, suggesting that the decision return to the water is made soon after exiting the water. Very little nesting activity of leatherback sea turtles takes place near the vegetation at the top of the beach.

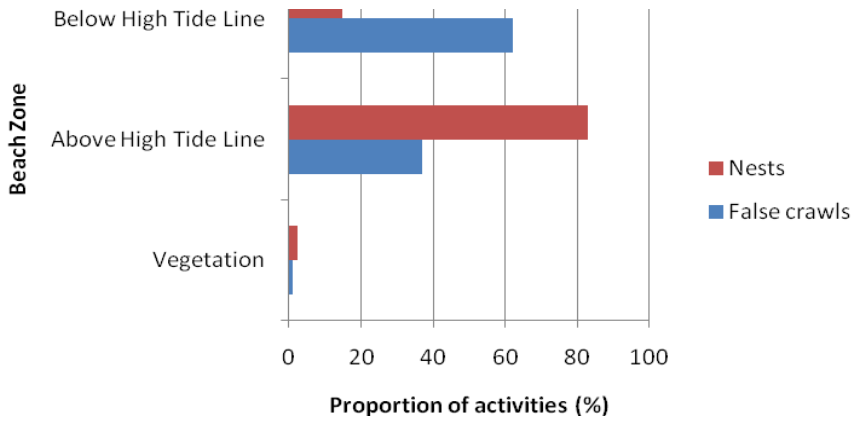

Figure 12: Location of nests categorised by zone of the beach i.e. in relation to the high tide line.

3.3. Tagging Program Results

A total of 473 individual females were identified this season in the PNR. For a complete list of females identified during the 2010 nesting season refer to appendix one.

All turtles with evidence of previous tags, or with external metal tags or internal PIT tags in place, are considered as remigrants to nesting beaches I.e. they have nested on one or more previous occasions. 362 remigrants were identified in PNR in 2010. A total of 111 leatherback females were identified and tagged for the first time during the 2010 season. These females, neophytes, were carefully examined for evidence of previous tags, both internal and external. 83% of nesting activity was accounted for by identified females, both neophytes and remigrants, leaving just 17% unaccounted for in terms of the mother of the nest.

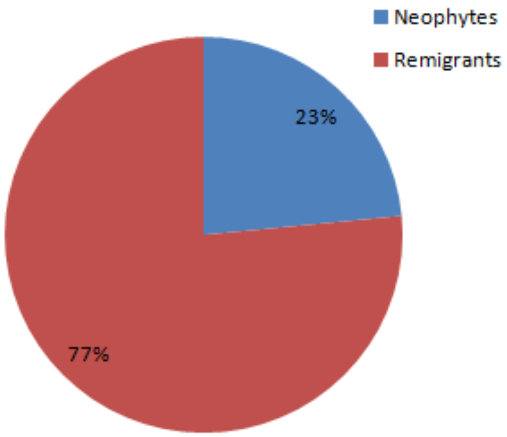

Figure 13: Proportion of identified females considered neophytes and remigrants to the populations.

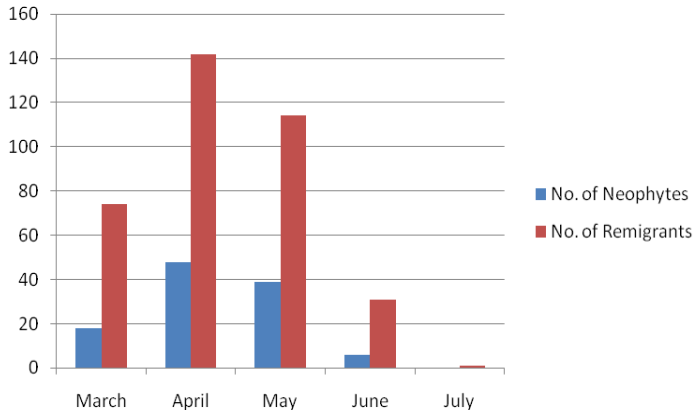

Figure 14: Number of neophytes and remigrants identified for the 1st time in the PNR each month.

Nearly a quarter of the females identified in the 2010 nesting season were neophytes. This is a similar value to the 2009 season in which 25% were classified as neophytes (figure 14). Figure 15 illustrates the number of turtles identified for the first time on the PNR each month. It can be seen that the proportion of remigrants to neophytes is similar throughout the season whole season. In April, the highest number of turtles were identified for the first time. By June and July, very few turtles were visiting the beach that had not been previously identified.

Table 1: Number of metal tags and PIT tags given to neophytes and remigrants during the 2010 season.

Given both tags		**Given 1 tag**		**PIT tag**		**Total**	
Neophytes	*Remigrants*	*Neophytes*	*Remigrants*	*Given*	*Existing*	*Neophytes*	*Remigrants*
74	32	35	67	126	12	111	362

The number of turtles tagged this season in PNR is presented in table 1. A major difference in the beach protocol this year was the addition of equipment for identifying and applying PIT (passive integrated transponder) tags. The use of this new equipment allows reserve staff to confirm neophytes to the population, as all previous tagginf efforts can be either identified or ruled out. PIT tagging began at the end of April, with 126 tags applied throughout the season. 12 existing tags from other projects were identified.

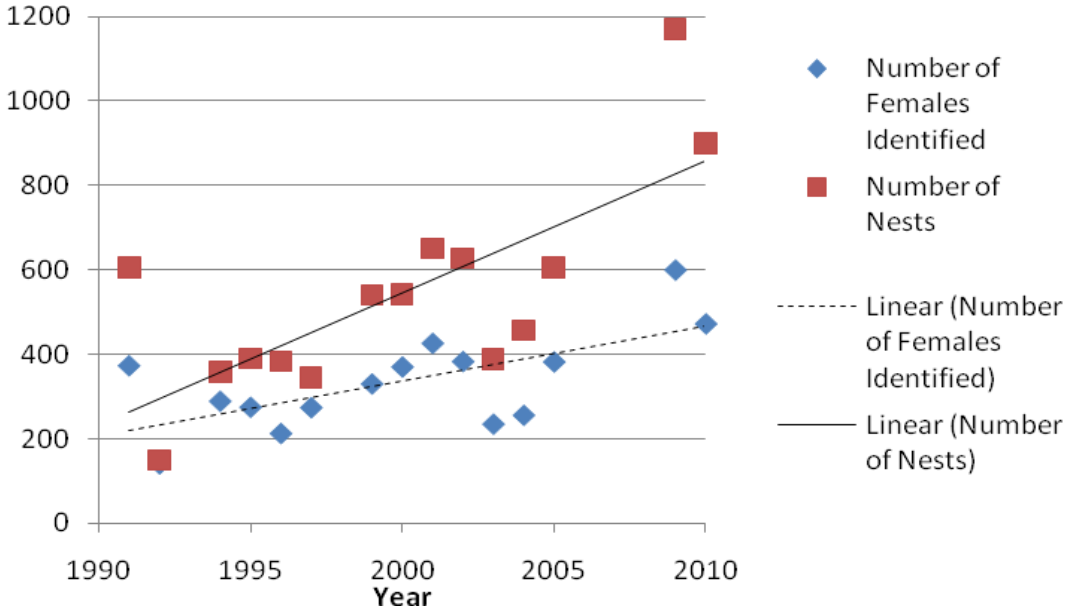

Figure 15: Number of females and number of nests registered in the PNR between 1990 and 2010.

There are increasing trends in both the number of nests laid in the PNR and the number of registered females each year within the reserve between 1990 and 2010 (figure 16). These positive trends, if representative of the leatherback population of which the leatherbacks nesting in PNR are a part of, suggest that conservation in the region is successful.

3.4. Migratory Movements and Nesting Intervals

3.4.1. Remigration

The history of remigration of females to PNR (see appendix one) can be studied using data collected during previous years by EWT. Unfortunately, detailed data is only available for the seasons between 1991 and 2005, meaning that those turtles identified in the PNR between 2006 and 2009 cannpot be compared with those identified in the 2010 season. Of the 362 remigrants identified in 2010, 33 had been previously identified in the nesting seasons between 1991 and 2005. Four of these turtles have been regularly returning to PNR since 1995.

The remigration intervals of the females studied (n=33) vary between 2 and 15 years. The most common remigration intervals are between 2 and 5 years, indicating that leatherbacks return to this beach between every 2 and 5 years to nest. Four turtles have a 15 year history of returning to the PNR to nest. One of these individuals, D8034/D8035, has returned every 2 or 3 years since 1995 to nest on the PNR beach.

3.4.2. Renesting and Philopatry

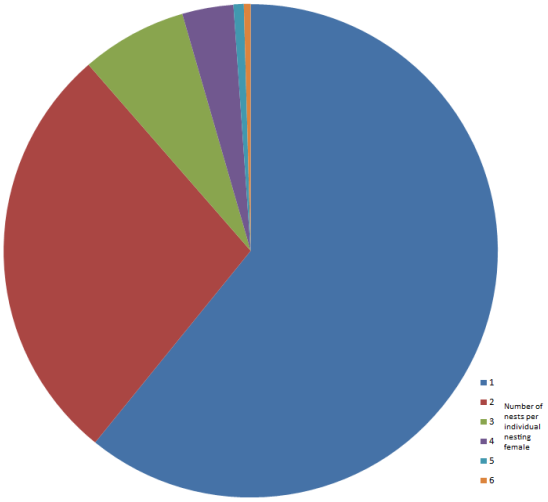

Figure 16: Number of nests laid by each identified female in the PNR in 2010.

A total of 206 females were registered more than once in PNR during this season, or 43.6% of identified sea turtles. Alvarado & Murphy (2000) report that the typical renesting interval for leatherback sea turtles in this region is 9 days. The data collected in Pacuare this season appears to support this assertion, with a renesting interval of between 9 and 10 days (Appendix Two).

Boulon (1996) stated that a leatherback sea turtle lays an average of 5 nests per season (each season she is nesting). Using this figure, it can be estimated that just 4.5% of the females visiting PNR show complete site fidelity to this beach, nesting between 4 and 6 times in PNR during the 2010 season (figure 17). This equates to 20 individuals. Two females laid 6 nests in PNR this season, the maximum number of nests registered to an individual turtle this season. These turtles were: VA4774/VA4775, and PN1748. PN1748 was tagged in PNR and is classified as a neophyte this season.

The average number of nests registered per identified female this season was 2 nests, a value lower than the average number expected for this species (according to Boulon, 1996). It can, therefore, be assumed that turtles are visiting other nesting beaches in the region during the season. In many instances, there is a renesting interval of between 16 and 29 days, suggesting that the turtle may have laid 1 or 2 nests at other beaches. 472 females laid a total of 899 nests during the 2010 season, suggesting that a further 1461 nests, based on an average of 5 nests per female, must have

been laid at other nesting sites in the region. There were also a number of occasions in which a female was identified but no nest was laid. 25 females were identified but never seen in process of laying. One individual identified in PNR, and also at a neighbouring project had injuries that resulted In her inability to lay a nest any time she visited the beach. These figures highlight the importance and urgency of the development of a common database in which data from all sea turtle conservation projects in the region can be entered. This would facilitate understanding of the movement of sea turtles between nesting events, and their movement between Caribbean nesting beaches. It would be interesting to observe movements in order to assess the extent to which leatherbacks in this region demonstrate philopatry to certain areas or beaches, and whether this differs between individual sea turtles.

An important consideration is the close proximitiy of many known leatherback nesting beaches around the PNR. The project to the south of PNR is essentially the same stretch of beach, divided only by human knowledge that the boundary exists. A more accurate representation of nesting on this beach would be achieved through the combination of the nesting data from PNR and Estacion Tortuga. This would generate more accurate data regarding new recruits to the population during each season and remigration to the beach.

The average number of eggs registered for nests laid in PNR this season is 77 fertile eggs and 31 infertile eggs (table 2). In order to calculate the average number of eggs per nest, the number of eggs counted in relocated nests, and those nests counted when laid in situ, were used (n=397).

Table 2: Average number of fertile and infertile eggs laid by leatherback sea turtles in PNR during the 2010 season, including standard deviation from the mean, and minimum and maximum numbers of eggs laid.

	Mean		SD	Max	Min
Fertile Eggs	77	±	19.7	131	0
Infertile Eggs	31	±	13.9	86	0

These values are lower than the mean observed by Chacon & Eckert (2007) for Gandoca beach (81.2 ± 17.88 fertile eggs), and are not significantly different from the values observed at this beach in 2009.

Following the close of the season an unexpected piece of data was obtained. On October 24th 2010 a female tagged in the PNR during the 2009 season was found dead in Grinquet harbour on the Great Northern Peninsula of Newfoundland in Canada. The turtle had tag numbers PN1458/PN1459, a curved carapace length of 152cm and a width of 104cm.

3.5. Physical Characteristics of Females

3.5.1. Biometrics

The biometric data of leatherback sea turtles from the 2010 season is summarized in table 3. These values are similar to the values outlined for this species in previous reports (Chacon & Eckert, 2007) and the data from 2009.

Table 3: Mean, maximum and minimum measurements, including standard deviation from the mean, taken from nesting leatherbacks in the PNR.

	Mean		SD	Max	Min
Curved Carapace Length (cm)	150.4	±	7.7	147	129
Curved Carapace Width (cm)	109.5	±	5.3	144	95
Nest Depth (cm)	72.2	±	6.3	96	50

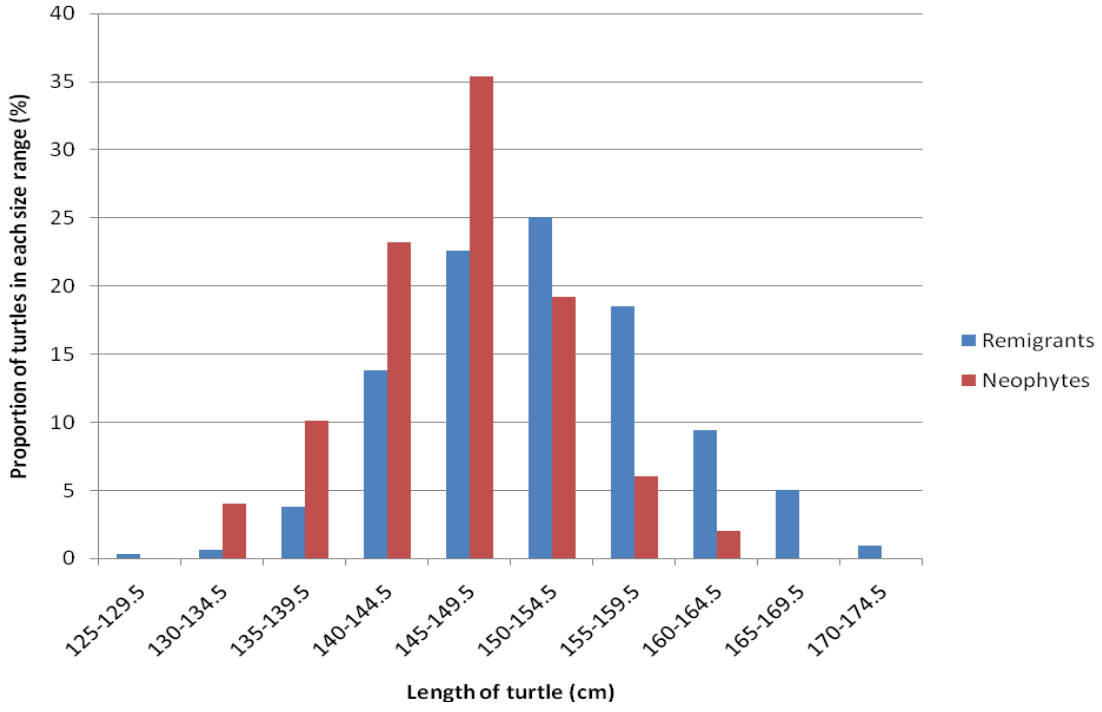

Figure 17: Size category distribution for neophyte and remigrant leatherback sea turtles in the PNR.

Figure 18 illustrates the difference in the distribution of length for neophytes and remigrants. It can be seen that the majority of neophytes fall in the 145cm-149.5cm size category whereas the

majority of remigrants fall in the 150cm-154.5cm category. This suggests that neophytes are generally smaller in size than remigrants. If neophytes are new recruits to the population, and younger turtles are assumed to be smaller in size, this is as would be expected. It should also be noted that a higher proportion of neophytes comprise the smaller size categories. Only remigrants are found in the two highest size categories.

3.5.2. External Condition of Females

Table 4: Observed external damages and epibionts to nesting females

Scars or Damages	
Head	4
Carapace	44
Front Right Flipper	63
Front Left Flipper	54
Back Right Flipper	93
Back Left Flipper	93
Fishing Line Scars	20
1/4 to 1/2 of Extremity Missing	
Flipper	36
Peduncle	3
Presence of Epibionts	
Mussels	1
Barnacles	5
Evidence of Previous Tags	
Old Tag Notch	26
Old Tag Hole	91

All females witnessed nesting were carefully observed by coordinators or research assistants in order to record any cuts, scars, or malformations that may be present. This information can be useful in the identification of threats to sea turtles in their natural environment. For example, 20 females this season had scarring on their shoulders as a result of entanglement in fishing gear. On some occasions, females return to the beach to renest and have been injured during the internesting period. During this season, after nesting previously, sea turtle VA9561/VA9567 returned to the beach with deep propeller scars to the central ridge of her carapace that were badly infected. Such injuries are cleaned and disinfected when appropriate in order to minimise infection. A complete list of the injuries documented to females this season are outlined in table 4.

3.6. Final Destination of Nests

The final destination of a particular nest is determined by coordinators or research assistants during the patrol in response to environmental and anthropogenic influences. Factors to take into consideration when determining the appropriate destination of a nest include:

- Likelihood of poaching
- Position of the natural nest on the beach i.e. above or below high tide line
- Tendency of a beach sector to erode
- Potential for inundation

In 2009, a high percentage of nests were relocated sue to extreme erosion across large sectors of the beach. This season it was not necessary to relocate such a high proportion of nests. Those nested laid in a position considered 'safe' by PNR staff were left in their natural location. However, if there was any doubt about their safety, relocation was the preferred destination. Furthermore, nests were also relocated in response to poaching events or presence of unknown people on the beach.

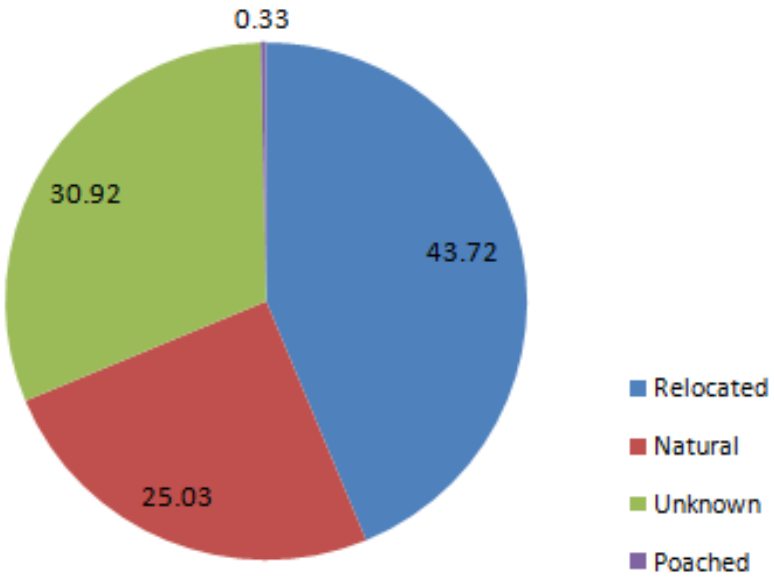

Figure 18: Percentages of leatherbcak nests that were relocated, natural, unknown and poached during the 2010 nesting season.

It is important to note that the level of poaching on this beach is incredibly low at just 0.33%, a fraction of that at other nesting beaches in the area. This low level can be attributed to an almost continuous presence of guards on the beach, combined with high presence of project staff, groups and volunteers thoughout both day and night. Another key factor that contributes to minimising poaching ist the camouflaging of every sea turtle activity that takes place on the beach.

3.7. Nest Survivorship

Of the 899 nests registered, 621 were triangulated (69.1%). 580 nests were successfully located and exhumed (64.5%) in order to determine the hatching success and estimate the reproductive output of the PNR for the 2010 season. A number of 'uncertain' nests were not recovered or exhumed. These nests were not triangulated as nesting was not witnesses. There is a possibility that many of these may have hatched, but evidence of hatching, such as hatchlings or their tracks, were not witnessed. It must also be taken into consideration that these nests may have been lost due to poaching, erosion or inundation, but since the exact location of the nests were unknown it was not possible to identify their fate.

Table 5: Results of the exhumations of D. coriacea nests carried out during the 2010 season.

	Natural	Relocated	Untriangulated	Total
Number of nests exhumed	149	310	121	**580**
Incubation time (days)	60.5	61.5	62	**61**
Total number of eggs	10407	21992	8438	**40837**
Number of empty egg shells	6028	13585	5496	**25109**
Neonates live in nest	70	523	109	**702**
Neonates dead in nest	118	558	158	**834**
Number of 'pipped' dead neonates	10	112	32	**154**
Number of unhatched (closed) eggs	4379	8407	2948	**15734**
No apparent development (%)	19.4	19.7	19.6	**19.57**
Stage 1 (%)	4.13	3.93	5.19	**4.42**
Stage 2 (%)	1.96	2.32	1.97	**2.08**
Stage 3 (%)	1.57	2.43	2.37	**2.12**
Stage 4 (%)	0.53	1.26	1.53	**1.11**
Undetermined (%)	14.59	8.31	7.72	**10.21**
Hatching success (%)	**57.9**	**61.8**	**65.1**	**61.60**
Emergence success (%)	**56.7**	**58.7**	**62.9**	**59.43**

The total number of leatherback sea turtle hatchlings produced during the 2010 season in the PNR is estimated at 40080 (calculated using the formula (mean number of eggs per nest x total number of nests) x mean hatching success (%)). PNR research assistants, volunteers and student groups exhumed a total of 580 nests (64.5% of registered nests). Of these 149 were natural 'in situ' nests, 310 were relocated, and 121 were untriangulated, natural nests. The results of these exhumations are detailed in table 5.

The data presented in table 5 shows that the relocated nests in PNR had a slightly higher hatching success than those left naturally. However, the untriangulated nests had the highest hatching succes of all nest destinations. Incubation time is consistent throughout each of the 3 destinations.

The slightly higher incubation time in the relocated nests may be attributed to the new location of the nests. These locations are typically closer to the vegetation and, as such, more shaded, consequently increasing the time taken for full development of the embryo. This may have implications for sea turtle populations due to temperature-dependent sex determination. If nest relocation is continued to shaded areas, nest temperatures should be monitored in an effort to estimate the sex ratio of hatchlings released from PNR.

A concerning statistic shown in table 5 is that of neonates both live and dead found inside the nest. For both types of natural nests these figures are fairly consistent. However, the proportion is considerably higher for relocated nests suggesting that the methods used for relocation need to be adapted to ensure that the maximum possible number of hatchlings are able to exit the nest. This may be due to the shape of the artificial nests constructed, or possibly over-compaction of the sand when refilling the nest.

4. Green Sea Turtle Nesting Results

4.1. Nesting Activity

The first recorded activity of the green sea turtles (*C. mydas*) in PNR was 20th March, 2010, near the beginning of the Leatherback season, with the first nest registered as 12th April. The official start date of the green sea turtle nesting season in PNR was June 2nd, with the start of more frequent occurrence of green turtle activity. Activities were recorded until September 28th, although nesting continued beyond this date. Data was collected until October 30th, although that data collected between September 28th and October 30th is not included in the data analysis of the current report.

99 nests and 116 false crawls were counted, making a total of 215 registered green turtle activities for the 2010 season. The number of nests is slightly higher than in 2009. The linear trend-line (figure 20) indicates a decreasing trend over the past 10 years ($R^2 = 0.1731$). The nesting figures 10 years ago were considerably higher than those registered in recent seasons.

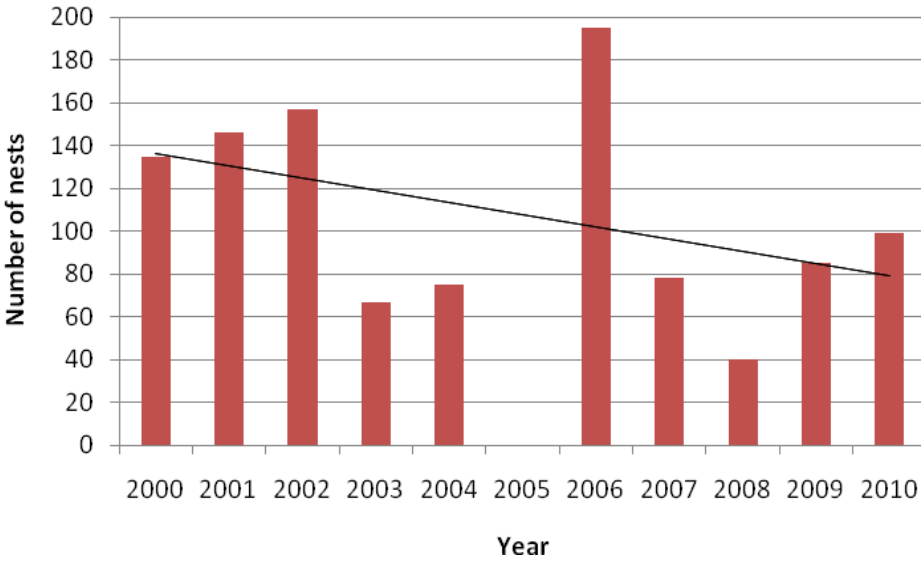

Figure 19: Bar chart representing annual nesting figures for *C. mydas* between 2000 and 2010.

4.2. Distribution of Nesting

4.2.1. Temporal distribution of nesting activity

As with leatherback sea turtles, the nesting of greens is not at a consistent level throughout the duration of the season. Figure 21 illustrates that the peak of green sea turtle activity occurred during August. As expected, the peak of false crawls is also at its peak in August. The density of activity in all other months is comparatively extremely low, with September being the only month

with more than 10 nesting activities, almost 10 times lower than the number of nests in August. This is comparable to the temporal distribution of *C. mydas* nests during the 2009 season.

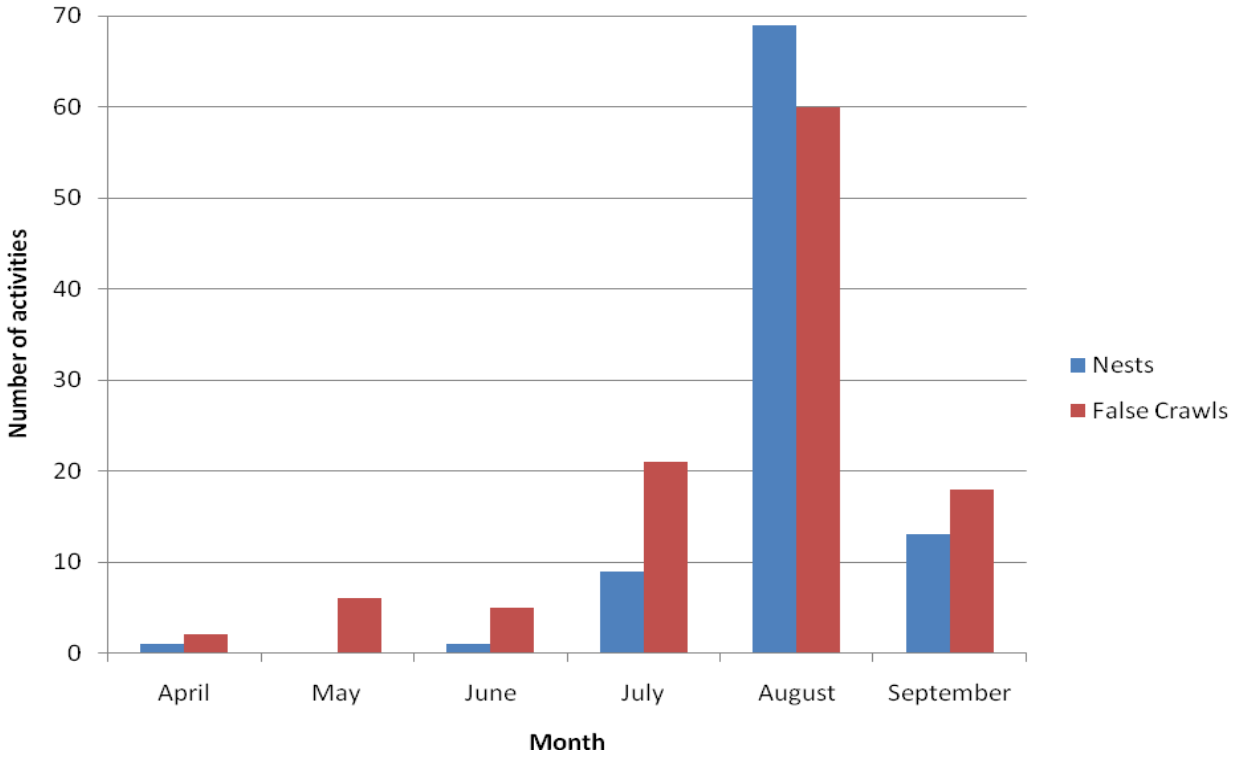

Figure 20: Monthly nesting activity of *C. mydas* in the PNR during the 2010 season.

It should be noted that nesting did not occur at a consistent level throughout August. Nesting was sporadic, with busy nights often followed by a high frequency of nights with very little or no nesting activities. As such, nesting was unpredictable. Daytime nesting of a green sea turtle was only witnessed once during the season.

4.2.2. Spatial distribution of nesting activity

Nesting activity was distributed unevenly across the 5.7km of monitored beach in the PNR (figure 22). Incidence of false crawls i.e. activity not resulting in a nesting event, occurred at a high level across much of the beach, with particularly high density between sectors 43 and 50. Unlike that of the leatherbacks, there are no definitive sectors on the beach that appear to be 'hotspots' for nesting. However, there are sectors in which nesting is very low or did not occur at all including sectors 0-2, 11-15, 31-32, and 47-51.

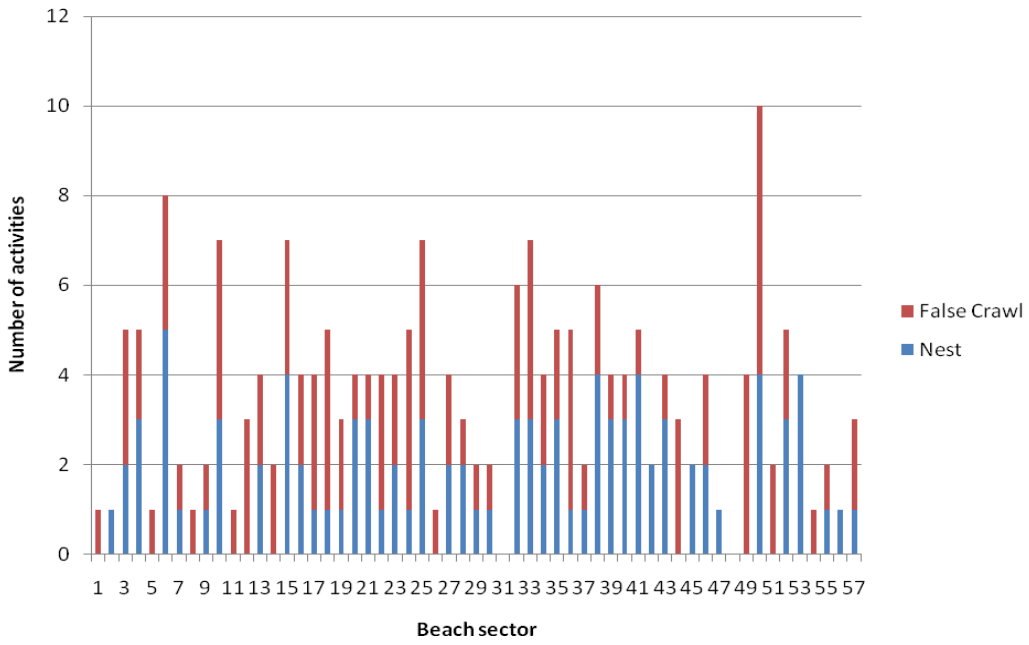

Figure 21: Distribution of *C. mydas* activities on the 5.7km of monitored beach in the PNR in 2010.

The majority of nesting events take place in the zone 'vegetation' i.e. in the plants and under the trees or bushes at the berm of the beach (figure 23). This is recognised as the preferred location of green sea turtle nesting. Very little activity took place below the high tide line, which is consistent with the view that green sea turtles select sites higher up the beach than leatherback sea turtles. The highest proportion of false crawls takes plave in the zone between the high tide line and the berm. However, the number of non-nesting events is fairly consistent throughout each of the 3 zones.

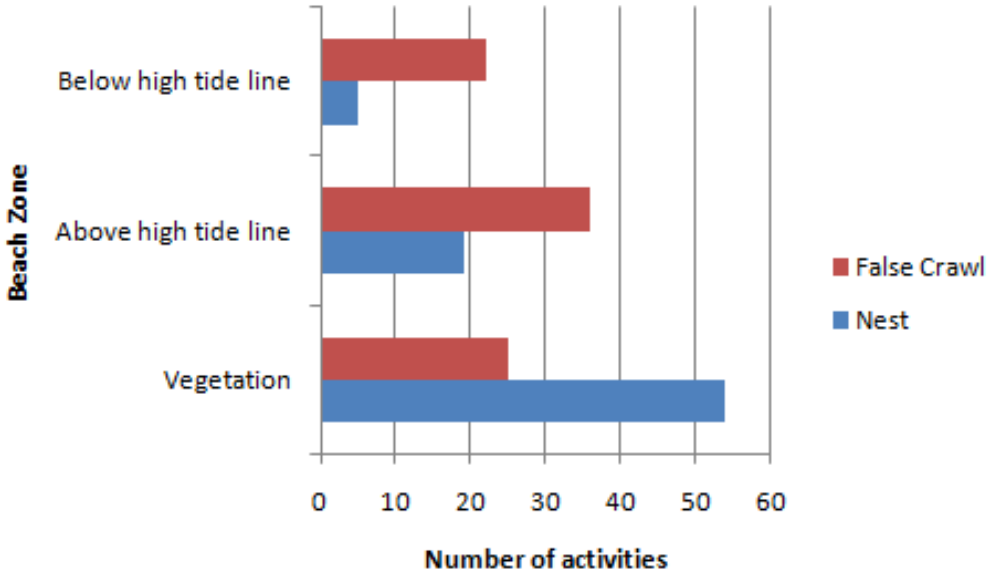

Figure 22: Location of *C. mydas* nests categorised by zone of the beach

4.3. Tagging Program Results

A total number of 38 individual female green sea turtles were identified and tagged this season in the PNR. 6 of these females were previously tagged in a different location, with 1 previously tagged in the PNR. For a complete list of the females identified during the 2010 nesting season, refer to Appendix 1.

Remigrants and neophytes were identified in the same manner as during leatherback season i.e. presence of tags and/or evidence of previous tags were noted and turtle would be regarded as a remigrant. A total of 32 individual females were identified and tagged for the first time in the PNR during the 2010 season. 39.4% of nesting activity was accounted for by identified females, both neophytes and remigrants, leaving 60.6% unaccounted for in terms of nest identification to a particular female. 2.6% of tagged individuals nested once throughout the season. Only 1 female returned to the beach and nested twice.

4.4. Biometrics

The biometric data of green sea turtles in the PNR this season is summarized in table 6. These values are similar to the measurements outlined for this species in previous literature (Chacón et al., 2007) and are similar to the data presented in the 2009 PNR nesting report.

Table 6: Mean, maximum and minimum measurements, including standard deviation from the mean, taken from nesting green sea turtles in the PNR.

	Mean	SD	Max	Min
Curved Carapace Length (cm) (n=68)	104.4	± 5.2	121.0	94.0
Curved Carapace Width (cm) (n=64)	93.4	± 4.7	105.0	83.0
Number of Eggs	97	± 25	145	29

4.5. Nest Destination

As with the leatherback nesting season, the final destination of the nest is decided primarily by the research assistant or patrol leader in response to anthropogenic and environmental influences that may affect the success of the nest. As shown in figure 23, the majority of nests were located near the vegetation indicating that there was little risk to nests due to erosion or inundation by the tide. As such, the majority of green sea turtle nests in the PNR were left in their natural location. Furthermore, during the green season, although presence of unknown individuals on and around the beach i.e. increased presence of boats in the vicinity, was somewhat heightened, the threat in terms of illegal egg collection was not considered to be high.

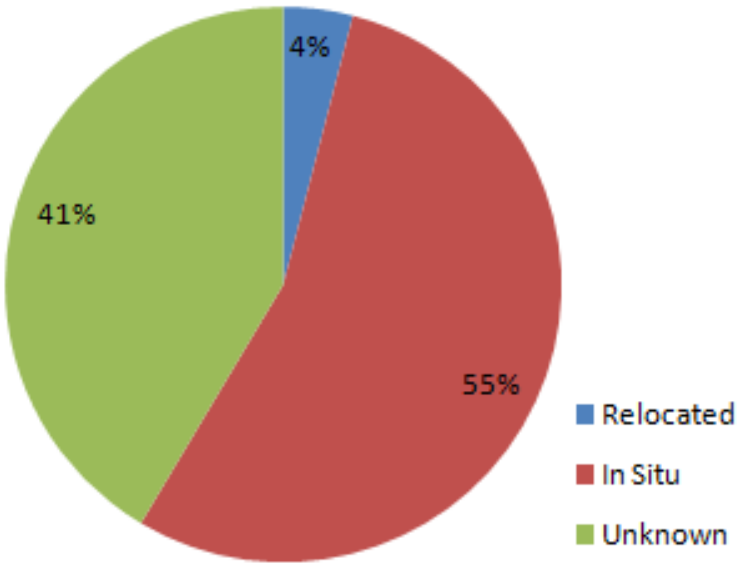

Figure 23: Percentages of green nests that were relocated, natural and unknown during the 2010 nesting season.

As shown in figure 24, only 4% of *C. mydas* nests were relocated. In one of these instances relocation was carried out as the turtle in question (PN0537/PN0568) demonstrated extremely unusual behavior in which, midway through nesting, she appeared to begin to dig again, subsequently removing and breaking already laid eggs from her nest. As many eggs as possible were salvaged and relocated. It is unknown if these eggs survived to hatching, or if this female exhibited normal or altered nesting behavior on other occasions.

The level of poaching of nests during the green sea turtle nesting season was 0%. However, the poaching of adult turtles was greatly increased, despite frequent communication and personal visits to the coastguard. Their vigilance certainly increased in the area, but the presence of illegal hunters was almost continuous throughout the season.

Two green sea turtles were found dead on the PNR beach during the 2010 season. Both turtles were adult females, and therefore would have been making a viable contribution to the breeding population of green sea turtles in the region. These turtles had rope through each of their flippers and harpoon holes in their carapace, indicating that their death was caused as a result of illegal hunting in the area. It is assumed that the turtles were hunted and thrown back into the sea when the police or coastguard entered the area. These turtles were measured and any details noted before being buried on the beach. Neither of the turtles possessed tags and, as such, could not be identified. Figure 25 is a photograph taken of one of these turtles. The coastguard and media i.e. television and newspapers, were notified of every occurrence of illegal hunting or poaching of sea turtles and their eggs.

Figure 24: Image of dead green sea turtle at sector 30. Turtle has rope through its flippers and a harpoon hole visible in its carapace.

4.6. Nest Survivorship

Only 3 green sea turtle nests hatched and were exhumed before September 28th, the official end of the season in the PNR. Further exhumations were carried out until October 30th, but the data was not available for analysis at the time of this report. The data is presented in table 7.

Table 7: Results of the exhumations of C. mydas nests carried out during the 2010 season.

Number of nests exhumed	**3**
Incubation time (days)	**98**
Total number of eggs	**269**
Number of empty egg shells	**194**
Neonates live in nest	**11**
Neonates dead in nest	**12**
Number of 'pipped' dead neonates	**4**
Number of unhatched (closed) eggs	**71**
No apparent development (%)	46
Stage 1 (%)	1
Stage 2 (%)	3
Stage 3 (%)	5
Stage 4 (%)	2
Undetermined (%)	14
Hatching success (%)	**72.1**
Emergence success (%)	**67.7**

Of the 99 registered nest only 3were exhumed. This does not provide an accurate representation of hatching success or nest survivorship of green sea turtle nests in the PNR and no conclusions can be drawn regarding the hatching success for the green season in the PNR.

5. Hawksbill Sea Turtle Nesting Results

5.1. Nesting Activity

The first recorded nesting activity of hawksbill sea turtles (*E. imbricata*) in the PNR was 17th June 2010, and hawksbill activity occurred sporadically between this time and the end of the beach monitoring period on September 28th 2010.

9 nests and 10 false crawls were counted, making a total of 19 hawksbill events for the 2010 season. It is difficult to regard this data in relation to previous seasons, as the numbers of hawksbill events are so few, and only recorded in the data from some seasons. In comparison with the 4 hawksbill activities in 2009, this number is particularly high. Nesting of hawksbill sea turtles constitutes only 0.8% of nests in the PNR during the 2010 season.

5.2. Distribution of Nesting

5.2.1. Temporal distribution of nesting activity

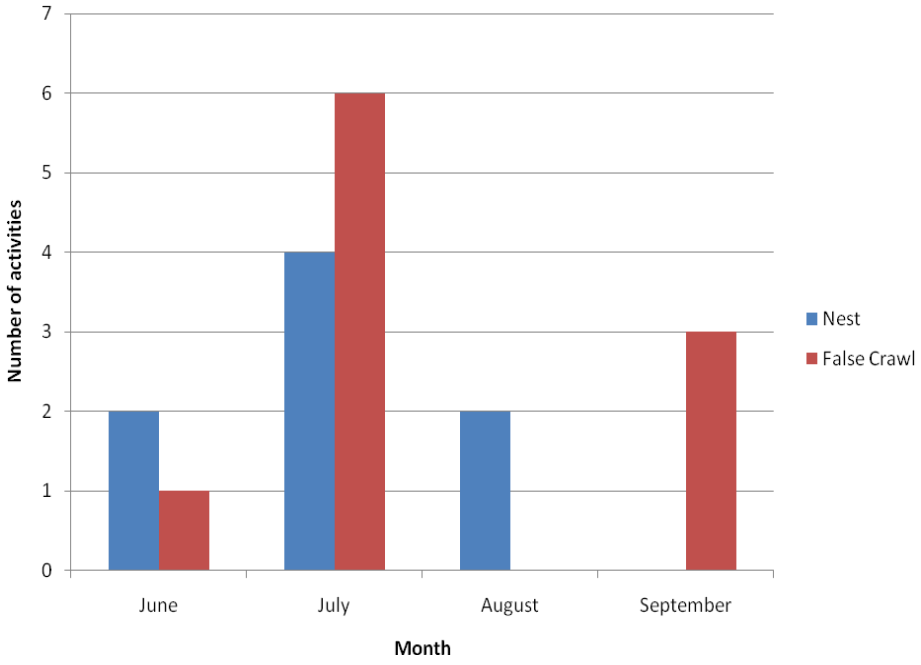

Figure 25: Distribution of the *E. imbricata* activity during the 2010 monitoring period in the PNR.

It can be observed that the level of hawksbill sea turtle nesting in the PNR is considerably lower than that of both leatherback sea turtles and green sea turtles within the PNR. It is possible that nesting continued beyond September as a number of false crawls occurred

The nesting of the hawksbill sea turtle took place between 17th June and September 28th when the monitoring of nesting activity ended in the PNR. The peak of hawksbill activity occurred in July, with

10 activities. Nesting activity was sporadic throughout these 4 months. However, with a renesting interval of between 14 and 16 days (Chacón et al, 2007), nesting can be somewhat predictable. Hawksbills show high fidelity to a particular beach, and location on that beach (Kamel & Mrosovsky, 2005) often returning to with a few hundred meters of the original nest site to re-nest. Patrols can therefore be alerted to be prepared for hawksbill activity in this area during certain time frames.

5.2.2. Spatial distribution of nesting activity

Figure 27 indicates that, as with leatherback and green sea turtles, the distribution of hawksbill nests is uneven throughout the length of the monitored beach in PNR. No definite trend can be established in this data as the frequency of activity is so low. At sector 49, the 2 nests registered were laid within 5 days of each other. No hawksbill activity occurred between sectors 0 and 15.

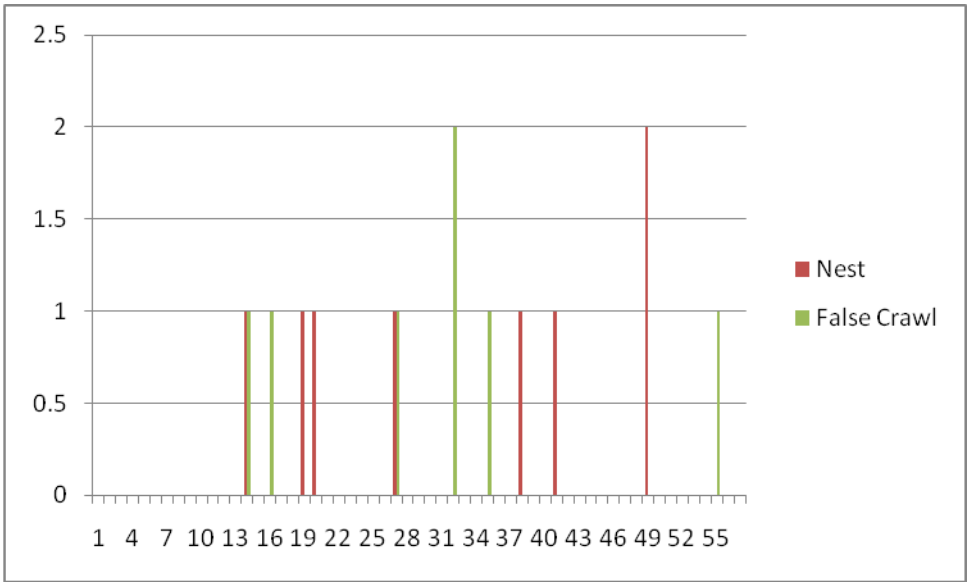

Figure 26: Distribution of *E. imbricata* activities along the 5.7km of monitored beach in PNR.

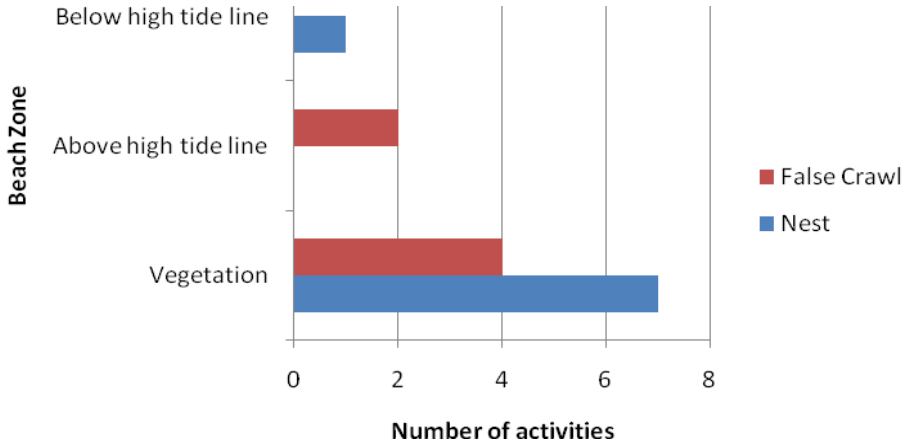

Figure 27: Location of *E. imbricata* activities categorized by zone of the beach in relation to the high tide line.

As with green sea turtles, figure 28 illustrates that the majority of hawksbills lay their nests in the vegetation zone of the beach, the highest possible location. No nests were laid at the in the zone between the vegetation and the high tide line. One nest was laid below the high tide line and this was the only hawksbill nest that was relocated. False crawls were registered in both the zone above the high tide and the vegetation, but none below the high tide. This suggests that very little hawksbill activity takes place below the high tide line.

5.3. Tagging Program Results

A total number of 5 individual female hawksbill sea turtles were identified and tagged this season in the PNR. Remigrants and neophytes were identified in the same manner as during leatherback season i.e. presence of tags and/or evidence of previous tags was noted and turtle would be regarded as a remigrant. A total of 5 individual females were identified and tagged for the first time in the PNR during the 2010 season. 44.4% of nesting activity was accounted for by identified females, both neophytes and remigrants, leaving 65.6% unaccounted for in terms of nest identification to a particular female. Only one individual was identified renesting i.e. returned to the beach on more than one occasion to nest. For a complete list of the females identified during the 2010 nesting season, refer to Appendix one

5.4. Biometrics

The biometric data of hawksbill sea turtles in the PNR this season is summarized in table 8. This data was collected from just 2 females encountered and measured on the beach. The low sample number for these measurements means that nothing can be concluded from these results, however they do provide an insight into the hawksbills nesting in the PNR. Furthermore, these values are similar to the measurements outlined for this species in previous literature (REF), and are similar to the data presented in the 2009 PNR nesting report.

Table 8: Mean, maximum and minimum measurements, including standard deviation from the mean, taken from nesting green sea turtles in the PNR.

	Mean	SD	Max	Min
Curved Carapace Length (cm) (n=2)	85.0	± 0	85.0	85.0
Curved Carapace Width (cm) (n=2)	76.5	±	78.0	75.0
Number of Eggs	151	±	156	146

5.5. Nest Destination

As with the leatherback and green nests, the final destination of the nest is decided primarily by the research assistant or patrol leader in response to anthropogenic and environmental influences that may ultimately affect the success of the nest. As shown in figure 28, all nests except for 1 were located near the vegetation indicating that there was little risk to nests due to erosion or inundation by the tide. In response to this natural behaviour of the hawksbill, locating nests in a theoretically safe area of the beach, relocation was not frequent. Only that nest laid below the high tide was relocated to an area higher on the beach.

The level of poaching of nests during the green sea turtle nesting season was 0%. However, the poaching of adult turtles was greatly increased. As the green and hawksbill nesting seasons occurred simultaneously in the PNR, the concerns related to poaching of eggs and hunting of turtles were alike. Although presence of unknown individuals on and around the beach i.e. increased presence of boats in the vicinity, was somewhat heightened, the threat in terms of illegal egg collection was not considered to be high.

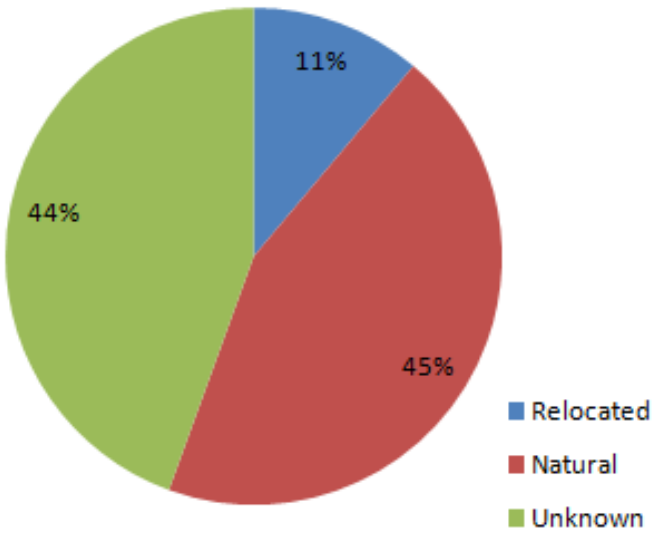

Figure 28: Percentages of hawksbill nests that were relocated, natural and unknown during the 2010 nesting season.

On one occasion, an adult hawksbill sea turtle was found dead on the PNR beach. This turtle was an adult female, and therefore would have been making a viable contribution to the breeding population of the critically endangered hawksbill sea turtles in the region. The turtle, shown in figure 30, had its carapace removed. This is consistent with known motives for hunting hawksbill sea turtles i.e. their valuable carapace, and suggests that there is still a market for this in the area.

Figure 29: Adult female hawksbill turtle found without carapace in the PNR, 2010.

5.6. Nest Survivorship

Only three hawksbill sea turtle nests hatched and were exhumed before September 28th, the official end of the season in the PNR. Further exhumations were carried out until October 30th, but the data was not available for analysis at the time of this report. The data is presented in table 9. Of the 9 registered nests only 33.3% were exhumed. This does not provide an accurate representation of hatching success or nest survivorship of hawksbill sea turtle nests in the PNR.

Table 9: Results of the exhumations of C. mydas nests carried out during the 2010 season.

	Nests
Number of nests exhumed	**3**
Total number of eggs	**321**
Number of empty egg shells	**284**
Number of 'pipped' dead neonates	**1**
Number of unhatched (closed) eggs	**36**
No apparent development (%)	21
Stage 1 (%)	6
Stage 2 (%)	1
Stage 3 (%)	2
Stage 4 (%)	2
Undetermined (%)	4
Hatching success (%)	**88.5**
Emergence success (%)	**88.5**

6. Discussion

6.1. Nesting Activity

The data collected this year suggests that the population of leatherbacks nesting in the south Caribbean may be increasing. The leatherback turtles nesting in the PNR are part of the Caribbean Costa Rica and Panama population assessed by Troëng et al (2004). They stated that there was a slight decline in this population of leatherback sea turtles between 1995 and 2003, although the data for the PNR during this period appears to be stable rather than declining. It is possible that these inconclusive trends may be attributable to inter-annual variations in nesting. PNR data from recent years may be interpreted as the beginning of an increasing trend in the number of nesting females and the number of nests. If nesting follows a 4 year cycle as suggested by the data collected in the PNR, the next 3 years will be crucial in determining whether the numbers of nesting turtles are increasing. In accordance with the 4 year cycle, the number of nests in the PNR should have dropped considerably this season. However, the number of nests was the third highest recorded in the history of the project in PNR. It is hoped that the numbers will remain high in the following years, demonstrating a gradual increase in the nesting population. This may provide evidence of the success of PNR in achieving its conservation goals.

At this stage it is important to take into account the nesting behaviour of leatherback sea turtles. It is possible that the conservation efforts of the EWT throughout the span of the project are having a positive effect on the leatherback nesting aggregation in this region, but that these effects are not obvious within the data of PNR itself. If those turtles that have previously nested in the PNR nest on other beaches in the southern Caribbean, it must also be considered that new recruits to the population, that have flourished as a result of the PNR conservation project, are also likely to nest at other beaches and subsequently may not be registered in the data at PNR. This highlights the need for a regional database with open exchange of information between nesting beach projects.

The number of green sea turtle nests is traditionally low in the PNR. The global population of the green sea turtle is estimated to have declined by 37-61% in the last 141 years (Troëng & Rankin, 2005). This decline has been attributed to human impacts including illegal hunting and egg removal from nesting beaches, and incidental bycatch in fisheries. However, the nesting population in Tortuguero (north of PNR) is estimated to have increased by 417% (Troëng & Rankin, 2005) but still there is no evident increase in the number of females nesting in the PNR. If, like leatherbacks, the green turtles nesting in Tortuguero and the PNR belong to the same nesting population it would be expected that the numbers on PNR and surrounding beaches e.g. Gandoca and Cahuita national park, would also increase. If green sea turtles demonstrate strong natal homing behaviour, and Tortuguero is the largest remaining rookery in the Atlantic basin, then an increase in green sea turtles nesting in this region would be most evident at that individual beach.

6.2. Tagging Program

The results derived from the tagging program provide valuable insight to the behaviour and life history of sea turtles. Hays (2004) commented that the low number of long time-series data-sets, which are essential due to sea turtle characteristics i.e. long maturation period, makes conservation of sea turtles difficult to monitor. The effects of conservation will not be witnessed until the next generation of turtles begins to come ashore to nest. Such effects should be evident as a significant increase in the proportion of neophytes registered over a number of nesting seasons. Although the number of nesting females seems to be increasing, probably in response to extended conservation efforts in this region, there is currently no notable increase in the proportion of neophytes registered at the PNR. The long-term monitoring of the beach at PNR should soon provide valuable information regarding sea turtle maturation i.e. expected increases in the number of neophytes due to the arrival of nesting females produced as hatchlings during the initial years of the project.

Dutton et al (1999) cite the global population of leatherbacks as between 26,000 and 43,000 females. However, the status of leatherbacks differs greatly based on location, with several nesting populations, e.g. the eastern Pacific leatherbacks, having declined sharply in recent years. The number of identified females in the PNR this season was 473, which is a similar number to that of the previous year. The increasing trend indicated in the data since 1991 may be attributed to the refinement of patrol protocols, meaning that a higher proportion of females are tagged and identified on the beach in current seasons than they were at the beginning of the program. Furthermore, although data regarding the percentage of neophytes was not available for historical years, it can be assumed that a greater proportion of females nesting in the PNR have previous tags, making identification easy even for a female returning to the ocean, and consequently increasing the identification rate. Knowledge of the number of females identified nesting in the PNR allows conclusions regarding the turtles visiting the PNR to be made, and the extent of philopatry in these individuals. It is only predictive of the entire nesting aggregation in the region when combined with data collected at other nesting sites in the area. Such a combination would allow an accurate estimation of the number of females in this population. If, as suggested by Troëng et al. (2004), 70% of turtles nesting in the Caribbean zone of Costa Rica converge in the protected areas of Tortuguero, Gandoca, Cahuita national park and the PNR, annual combination and analysis of the data collected at each of these sites is critical to estimating population size, along with recognizing and responding to changes in numbers.

The identification of a PNR tagged leatherback turtle off the coast of Newfoundland, coupled with identification of 1 individual tagged in Canada nesting in the PNR, provides evidence that the leatherbacks nesting in the PNR migrate northwards to colder waters to feed. The 1 year time period between tagging in Costa Rica and identification in Canada suggests that they migrate directly from nesting grounds to feeding grounds. Ordoñez et al. (2007) report similar evidence, with an individual tagged in Canada registered nesting on Chiriqui beach, Panama. Such evidence highlights the considerable migrations made by this population of turtles. This emphasizes the

importance of international protection of sea turtles, as these migrations take them across many borders with differing laws and enforcements of regulations. Threats including incidental capture in fisheries can have severe negative effects on sea turtle populations.

6.3. Physical Characteristics

The data collected regarding the biometrics of sea turtles nesting in the PNR serves a number of purposes. It further supports the previously defined size ranges of leatherback sea turtles in this region (Chacón et al, 2007). In this report it may also be used to confirm that neophytes are being correctly classified. In the initial years of research at any sea turtle conservation project, those turtles tagged are not simply new recruits to the population, but all sea turtles nesting on that beach. The nesting populations should be saturated with tags within 5 years of the start of the tagging program (conservative estimate if renesting interval is 2-3 years). After this point, all turtles tagged for the first time during a given nesting season should be new recruits to the population. Therefore, an increase in the number of smaller, previously untagged turtles should indicate an increase in the number of neophytes. At this stage in the history of the PNR we are trying to identify data that may indicate the success of the conservation project. As yet a distinct increase in the number of neophytes, smaller turtles, or a significant decrease in the average size of nesting turtles, is not evident. However, these are important aspects to consider in the data from future nesting seasons. Data collected regarding damages to females may be used to further confirm the classification of an individual turtle as a neophyte. It is expected that younger turtles i.e. with a shorter period of time for exposure to threats, will have fewer bodily damages and scars.

6.4. Exhumations

The results of exhumations can be critical for informing the conservation techniques and beach management strategies applied in certain situations. At beaches where poaching is extremely problematic, as used to be the case in the PNR and still applies to other beaches in the region, nest relocation is the advised strategy to protect the nest. Relocation confuses poachers and means that the exact location of the nest is not obvious. However, it has been asserted that the manipulation of the eggs associated with relocation can be detrimental to the nest, facilitating new pathways for the entrance and proliferation of organisms that may potentially destroy the eggs and infest the nest (REF). The large size of leatherback eggs means that they are more fragile than those of other species, and excessive movement may also be detrimental to the developing embryo. As poaching of leatherback nests has been reduced to a minimal problem in the PNR, it is no longer essential to relocate all of the nests. Instead, decisions to relocate nests in 2010 were based on the suitability of the location chosen by the female. For example, if the nest was laid below or very close to the high tide line the decision would normally be made to relocate the nest. Furthermore, if the nest was located in a sector of the beach prone to erosion, where large areas of the beach are lost at different points throughout the season, the nest would typically be relocated to a more stable sector of the beach.

6.5. Poaching and illegal hunting

The levels of illegal egg removal within the PNR have remained low in recent years due to the presence of the reserve guards and the high amount of beach activity both during the day and the night. It can, therefore, be stated that the PNR is highly successful in terms of conservation and protection within the reserve boundaries. It is essential to consider these results in a regional context and compare the success of the PNR to surrounding projects. Personal communication with a number of individuals related to other sea turtle projects indicated that although the PNR has controlled poaching within its limits, illegal egg removal is still prevalent and a cause for concern in many projects on neighbouring beaches. It is likely that the problem of poaching has simply been displaced rather than solved. As discussed in this report, leatherback sea turtles demonstrate natal homing to the region rather than a specific beach meaning that those turtles that nest in the PNR will nest on other, less protected beaches during the season.

At the onset of the green turtle nesting there is a shift from illegal egg harvest to hunting of individuals, with harpooning of mating pairs frequently witnessed from the beach, approximately 1km offshore. As a nesting beach project with few resources it is practically impossible to address this situation in a direct manner. This season a proactive approach was taken by trying to build a positive relationship with the coastguard station in Moin. This relationship should be continued in following years, keeping lines of communication open and informing the authorities of all unwelcome hunting activity taking place in the area.

It is important to address the drivers of egg poaching and hunting on a local and national level. PNR has a responsibility to the surrounding communities to initiate some level of outreach such as dissemination of information regarding the sea turtle project and the progress made in recent years. It must be recognized that, although illegal, consumption of sea turtles and their eggs is a deep-rooted cultural practice in Costa Rica and without efforts to provide alternative sources of income and incentives to stop poaching, this practice will continue to be problematic in the region. It is recommended that steps should be taken to invest communities in their local environment.

6.6. Recommendations

Of primary importance to the complete understanding of the population of marine turtles nesting in PNR is the availability of a comprehensive database of PNR data, spanning the complete history of the project. All data should be available to allow comparison and analysis, facilitating assessment both sea turtle populations and project success. Furthermore, in order to understand the sea turtle aggregation in the PNR, data from all nesting beaches in the region must be combined and made available to all projects. This will enable detailed understanding of interesting migrations, the extent of nesting beach fidelity, and more accurate accounts of the activity of each individual to

name a few. It is understood that such a database is currently being developed, and it is hoped that this occurs in the near future.

A further recommendation related to the increase of hatching success in the PNR is to build a hatchery between sectors 4 and 5 of the beach for all 3 species of turtle nest. This hatchery would primarily house those leatherback nests laid between sectors 1 and 3, all of which are currently relocated beyond sector. As all nests must be relocated from this area it would be highly beneficial to place them in a prepared location where measures are taken to improve sand quality and nest conditions.

It is also recommended that efforts are made to enter the full collection of data for the PNR into digital format. The creation of a database, allowing easy identification of returning females and comparisons of biometric data should be considered. This database should be updated annually, providing coordinators with a comprehensive history of activity in the PNR.

7. Conclusion

While many interesting trends can be drawn from the many years of data collected within the PNR, it is essential that a complete database of all existing information is created to enable detailed analysis. From the current data, there is no conclusive evidence to indicate the return of hatchlings, now as reproductively viable females, to the beaches of the PNR i.e. increased numbers of neophytes as a result of conservation efforts at the initiation of the project. This should be a focus of research in the following seasons, in order to confirm the success of beach protection and protocols, and the benefits to the local leatherback nesting population.

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Appendix 1: Tag numbers of all turtles registered nesting in the PNR, 2010.

Tags in 'bold' font are newly placed tags.

Leatherback sea turtles: Neophytes.

Left Tag	Right Tag	PIT tag
PN1796	**PN1797**	**985121019401393**
VC2055	**VC2056**	**985121020432918**
PN1760	**VC2028**	**985121020433049**
PN1748	**-**	**985121020435119**
VC2013	**VC2014**	**985121020439939**
-	**-**	**985121020441556**
PN1726	**PN1727**	**985121020470855**
VC2061	**VC2062**	**985121020471365**
PN1898	**VC2172**	**985121020471695**
PN1854	**PN1855**	**985121020473794**
VC2016	**-**	**985121020475195**
VC2089	**VC2090**	**985121020477974**
PN1813	**VC2035**	**985121020479917**
VC2033	**VC2034**	**985121020482157**
VC2053	**VC2054**	**985121020483785**
VC2151	**VC2152**	**985121020504485**
VC2099	**VC2100**	**985121020504532**
VC2175	**VC2120**	**985121020506937**
PN1802	**VC2177**	**985121020509194**
VC2081	**VC2082**	**985121020511380**
PN1846	**PN1847**	**985121020514793**
PN1863	**VC2173**	**985121020514846**
PN1840	**VC2037**	**985121020515584**
VC2079	**VC2080**	**985121020519125**
VC2107	**VC2108**	**985121020520678**
PN1792	**-**	**985121020547219**
PN1761	**-**	**985121020547285**
PN1882	**PN1883**	**985121020547506**
-	**-**	**985121020547518**
PN1886	**PN1887**	**985121020547615**
-	**PN1749**	**985121020551381**
PN1814	**-**	**985121020551458**
VC2161	**VC2162**	**985121020559568**
VC2059	**VC2060**	**985121020559859**
VC2005	**VC2006**	
PN1653		
PN1654	**-**	

Left Tag	Right Tag	Left Tag	Right Tag
PN1899	**-**	**PN1856**	**PN1857**
PN1703	**PN1704**	**PN1858**	**-**
PN1706	**PN1707**	**PN1859**	**-**
PN1708	**PN1709**	**PN1861**	**-**
PN1712	**PN1713**	**PN1862**	**-**
PN1715	**PN1716**	**PN1864**	**PN1865**
PN1719	**-**	**PN1869**	**-**
PN1722	**-**	**PN1870**	**PN1871**
PN1723	**VC2104**	**PN1872**	**PN1873**
PN1730	**PN1731**	**PN1874**	**PN1875**
PN1732	**PN1733**	**PN1876**	**PN1877**
PN1743	**PN1744**	**PN1878**	**VC2098**
PN1752	**PN1753**	**PN1884**	**PN1885**
PN1756	**VC2038**	**PN1889**	**-**
PN1759	**-**	**PN1891**	**VC2063**
PN1770	**PN1771**	**PN1896**	**-**
PN1776	**PN1777**	**PN1897**	**-**
PN1782	**-**	**VC2167**	**PN2186**
PN1784	**PN1785**	**VC0834**	**VC0835**
PN1786	**PN1787**	**VC1508**	**VC1509**
PN1790	**-**	**VC2018**	**-**
PN1808	**PN1809**	**VC2025**	**VC2026**
PN1810	**VC1201**	**VC2043**	**-**
PN1820	**PN1821**	**VC2064**	**-**
PN1822	**PN1823**	**VC2065**	**VC2066**
PN1826	**-**	**VC2085**	**VC2086**
PN1827	**-**	**VC2087**	**VC2088**
PN1829	**-**	**VC2091**	**VC2092**
PN1833	**-**	**VC2093**	**VC2094**
PN1835	**-**	**VC2101**	**VC2116**
PN1838	**PN1839**	**VC2109**	**VC2110**
PN1842	**-**	**VC2113**	**-**
PN1844	**-**	**VC2117**	**VC2118**
PN1848	**PN1849**	**VC2124**	**-**
PN1850	**-**	**VC2130**	**VC2131**
PN1851	**-**	**VC2159**	**VC2160**
PN1852	**PN1853**	**VC2163**	**VC2164**
		VC2167	**PN2186**

Leatherback Sea Turtles: Remigrants

Left Tag	Right Tag	PIT Tag
VA9536	PM0642	**985121020205530**
VC1139	VA4867	**985121020427866**
VA8037		**985121020429133**
VC2083	**VC2084**	**985121020429331**
	VA1869	**985121020431154**
79223	79224	**985121020431223**
VC2114	VC0652	**985121020431308**
PN1757	**VC2020**	**985121020431427**
VC2047	**VC2048**	**985121020433103**
79145	VC0330	**985121020433304**
VA9408	**VC2156**	**985121020433511**
VA5928	VA5876	**985121020433539**
-	-	**985121020437480**
	VC2168	**985121020439683**
79425	VC0168	**985121020441534**
VA3551		**985121020441766**
PN1841	**VC2127**	**985121020441774**
VA4510	VA2061	**985121020442162**
	VA4728	**985121020443694**
VC2157	**VC2158**	**985121020443819**
VC2041	VC0259	**985121020443884**
VA2182	PN0561	**985121020469951**
VA4829	VA4350	**985121020471565**
V2242	**VC3242**	**985121020472107**
VC0202	VC1129	**985121020472799**
VA3476	VC0488	**985121020472801**
PM0655	**VC2021**	**985121020472936**
VA3463	VC0339	**985121020474202**
VC2078	**VC2002**	**985121020474909**
VA2184	VA2185	**985121020475003**
79153	79154	**985121020475025**
VC0323	VC0324	**985121020475524**
PN1745	PN1746	**985121020475530**
VC0321	VC0322	**985121020475829**
VC0134	VC0135	**985121020477893**
79538	69513	**985121020477916**
VA4841	VA4842	**985121020477918**
PN1758		**985121020479955**
VA9645	PM0639	**985121020480671**

Left Tag	Right Tag	PIT Tag
VC0480	VC0482	**985121020480865**
PN1793		**985121020482387**
VA9616	VA9617	**985121020482844**
VA1766	VA1767	**985121020483469**
PN1768	**PN1769**	**985121020484226**
VA8858	VA8865	**985121020484612**
D10241	D10240	**985121020485525**
CH1533	CH1534	**985121020486361**
VA4217	VA4218	**985121020488569**
PN1762	**PN1763**	**985121020504295**
VA7940	VA7941	**985121020505750**
VA2378		**985121020506122**
79736	**VC2180**	**985121020506966**
VA9561	VA9567	**985121020507051**
PM0651	PM0694	**985121020509942**
VC0296	VC0297	**985121020510019**
PM0657	PM0658	**985121020510677**
VC2169	VA1802	**985121020510694**
VC1203	VC3103	**985121020511523**
PM0307	PM0310	**985121020512259**
VC2057	**VC2058**	**985121020512774**
VC0401	VA5889	**985121020512806**
PN1824	PN1825	**985121020512811**
VA4205	VA4206	**985121020513326**
PN1800	V2690	**985121020514461**
VA5970	D7552	**985121020515671**
VC0262		**985121020516413**
79581	79580	**985121020516664**
VA5825	79150	**985121020517830**
PN1657	PN1658	**985121020519780**
VC2473	VC2474	**985121020519942**
VA9282	VA9283	**985121020520398**
VA3650	VA3651	**985121020520459**
VC0005	VC0306	**985121020520476**
VA8106	VC1604	**985121020520488**
VA4774	VA4775	**985121020545944**
VA8698	VA8696	**985121020545950**
PN1866	**PN1867**	**985121020547189**
VC0010	**VC2170**	**985121020547535**

Leatherback Sea Turtles: Remigrants

Left Tag	Right Tag	PIT Tag
D10373	D10374	**985121020549777**
PM0598	**VC2031**	**985121020551404**
VA5714	VA5715	**985121020551436**
VC2106		**985121020551914**
VA4893	VA4894	**985121020553522**
PM0632	PM0633	**985121020555276**
PM0617	PM0618	**985121020555786**
VA4335	V2718	**985121020557948**
PN1812		**985121020559525**
VA5811	VC0457	**985121020559555**
VC0146	VC0147	**985121020561375**
PN1801	VA9305	**985121020561446**
VC0312	**VC2125**	**985121020561506**
PN1789	VA4184	**985121020444100**
79440	79441	127115293A
VA5872	VA0180	131929765A
VA6846	VA7953	132135760A
PM0641		132231614A
79488	79489	132271646A
VC1705	VC1706	132715620A
PN1766		1C5FK43E558E5pQD
VC2023	**VC2024**	6KQCA9024KM1AUJ3
PN1791		7KUBBMUJR70AVF1H
VC2153	**VC2154**	D1JLDUEGUTB48Q3P
VC2012	**VC2027**	JME586NC334GNFHS
VA9571	VC0475	MIPMDF6JNB01KPST
VA2399	VA2398	NQULKFLJ7H3P1T35
VA3206	VA3207	
VA4185	V2137	
VA9695		
VA5608	VA5609	
VC0416	VC0417	
PN0623	CV1084	
VA9462	VA4211	
V2224	V2225	
79340	79341	
VC2009		
V2102		
VC0473		

Left Tag	Right Tag
VA3129	PN1831
VA1185	VA3495
VC2214	**VC2171**
	VA3465
	VC0055
VA5815	
VA4959	VA4960
VA2374	VA2375
PN1595	**PN1596**
PN1051	PN1052
VA0753	VA4170
VA9217	VA9218
V4659	VA5016
VA7571	VC0475
PN1665	77700
VA4140	
VA1176	**PN1728**
76014	76015
VA8991	**PN1729**
V2424	**PN1868**
PN1765	VA8314
VA9079	VC0302
VA3247	**PN1828**
VA4124	VA4123
79371	**PN1735**
VA6211	VA6212
VC0333	VC0334
A9565	79083
PN1663	70130
VA3149	VA3148
78691	VA2262
	PN1711
VC0295	VA4823
VA8040	
VA1859	**PN1834**
PN1984	**PN1985**
VC2105	VA5152
VA9509	79354
VC0382	VA5875

Leatherback Sea Turtles: Remigrants

Left Tag	Right Tag
VA3243	VA2369
VA3947	PN1828
V2261	PN1705
PN1780	-
79249	79252
VC0126	VC0127
VA1916	-
PN1900	VA3270
CH1966	-
-	VA7598
PN1078	PN1001
VA2576	VA4755
-	VA1483
-	VA5006
VA4202	VA4206
PN1894	PN1895
D8034	D8035
VA3264	VA4091
VA9213	VA6883
VA3296	77217
PN1788	-
VA1048	78706
VA9437	VC1161
VA3545	VA3546
VA3545	VA3546
PN1769	VA9303
VA8641	VA5844
VC1014	VC1012
PN1159	PN1150
PN1843	-
PM0646	PM0645
VA4721	-
PM0624	PM0625
VA9382	-
VA7919	VA7918
PN1892	**-**
PM0344	PM0345
PN1890	-
VA4747	VA4780

Left Tag	Right Tag
VA5247	PN1828
PM0608	PM0619
PM1745	PM1746
VA9004	VC0050
VA7974	VA7975
VA4346	VA4347
VA2759	VA2760
VA5919	VA9900
VA2473	VA2474
VA7917	VA7918
VA4142	VA4141
79927	79926
PN0645	PN0646
PN1845	-
VA9591	-
VA7938	VA7939
PN1817	-
VC1621	VC1622
VA4862	VA4864
VA9614	VA9625
PN1652	**-**
IV00466	-
PN1754	-
VA4114	VA4215
VC0396	8067
VC1117	VA4111
VA8797	VA9613
VA5904	VA5905
VC3116	PM0660
PN1832	VC1227
VA8423	VA8422
VA4874	VC0257
VA5834	VA5874
PN1815	VA4381
07769	07770
VC2029	**VC2030**
VA1813	VA1814
PM0440	V4554
VC2051	**VC2052**

Left Tag	Right Tag
VA9608	VA3615
VA4324	VA4322
VA4265	D8038
VA9618	-
VC2003	VC2004
VC0561	VC1683
VC3143	VC3144
VA8870	VA9005
VC2074	**VC2050**
VC2095	**VC2096**
VC2019	VC3175
VA8985	VA8987
VC1009	**-**
PN0310	PM0307
VC0322	VC0321
VC0302	-
VC3152	PN1837
VA1421	VA1422
PM0645	PM0646
VC9571	VC0475
VA4822	VA4821
VA6154	VA4660
	VA8050
CH2513	CH2514
VA4534	VA4635
VC1020	VC1018
VC2174	PN1883
VC1775	VC1774
PN1873	PN1872
VA2376	VA9537
PN2801	**PN2802**
PM0580	79812
VA9577	VC0475
VC1241	V2122
VC2132	VC2050
VA3775	VA3777
PM0661	PM0662
VA9454	-
76195	-

Leatherback Sea Turtles: Remigrants

Left Tag	Right Tag
PN1747	VA1868
VC0419	VC0423
VA8969	VA8872
VA4879	VA1077
PN1775	-
VA5390	VA5673
VA4057	VA4056
VA4868	-
VA3583	-
VA4010	VA4009
PM0643	PM0649
PM0640	V4554
VA8114	VA8113
VA7920	VA7921
VA7920	VA7921
VC3153	**VC2126**
PN1738	**PN1739**
79391	79392
V2961	**PN1705**
PN1724	**PN1725**
PN1750	**PN1751**
VA3270	**PN1900**
VC1063	VC1061
VC0235	VC0236
VA1545	VA1546
VC0245	VA4394
VA5838	VA1448
VA9604	VA9624
PN1819	**PN1818**
69575	D7535
PN1774	PM0634
VA9185	VA9193
V2128	**PN1837**
PN1718	-
VA6929	VA6928
PN1794	-
VA9548	VA5409
PN1860	PM0691
VC0466	-

Left Tag	Right Tag
-	VA4325
PN1888	VA5489
VA9379	VA5494
-	VC1090
VA4093	VA4092
VA5837	VA1018
VC0651	VC0652
VC0013	VC0014
VA3541	VA3452
VA2329	PM0672
PN1043	**VC2036**
79369	79370
VC0494	VA2714
PN1798	-
PM0345	PM0344
VA3201	VA3203
VC1162	VC1163
PM0666	PM0667
VC2075	VC2076
VC1017	VC1016
VA1427	VA1428
CAN430	CAN433
VC1060	VC1059
PN1720	VA9606
VA5457	VA9311
VA4455	VA4456
PN1602	-
VA9600	VA3615
VC0051	VA1666
PN1373	VA3644
VC0030	VC0031
PN1806	**PN1807**
PM0615	PM0616
VC1169	CH4269
VA9591	-
PN1783	**VC2155**
VA5821	79821
PN1736	**PN1737**
VA3564	-

Left Tag	Right Tag
PN1714	VC0460
VA8633	VA1753
VA9596	VA5839
VA5004	**PN1721**
VA9476	VA9477
VA3882	VC0444
PN1764	VA9303
VA3212	**PN1740**
VA4214	VA4215
VC3129	**PN1831**

Green Sea Turtles:
Neophytes

Left Tag	Right Tag
PN0390	**PN0449**
PN0491	**PN0492**
PN0525	**PN0627**
PN0537	**PN0568**
PN0540	**PN0588**
PN0571	
PN0572	**PN0579**
PN0610	**PN0611**
PN0618	
PN0630	**PN0631**
PN0632	**PN0633**
PN0634	**PN0635**
PN0636	**PN0637**
PN0640	**PN0641**
PN0642	**PN0643**
PN0646	
PN0651	
PN0661	**PN0662**
PN0667	**PN0685**
PN0675	
PN0676	**PN0677**
PN0692	
PN0697	**PN0696**
PN0707	**PN0708**
PN0823	**PN0824**
PN0825	**PN0826**
PN0831	**PN0832**
PN0845	**PN0846**
PN0853	**PN0854**
PN0877	**PN0878**
PN0879	**PN0890**

Remigrants

Left Tag	Right Tag
81400	81399
113724	113725
PM0220	PM0221
PN0218	
PN0339	PN0390
PN0762	111960
TTJ207	TTJ208

Hawksbill Sea Turtles:
Neophytes

Right Tag	**Left Tag**
	PN0639
PN0644	**PN0668**
PN0245	
PN0698	
PN0622	**PN0623**

Appendix Two: Leatherback Activity, Reserva Pacuare 2010

Right Tag	Left Tag	PIT tag	Ave. CCL	Ave CCW	1st Event	2nd Event	3rd Event	4th Event	5th Event	6th Event	7th Event	8th Event
VC0051	VA1666	-	153.50	103.00	03/03/10 ((R))	21/03/10 (R)	16/04/10 (IS)					
PN1736	**PN1737**	-	153.00	110.00	04/03/10 (NP)	04/04/10 (NP)	30/04/10 (R)	10/05/10 (NS)				
-	VC0055	-	160.00	-	05/03/10 (NS)							
VA5815		-	158.00	118.00	08/03/10 (R)							
PN1726	**PN1727**	**985121020470855**	158.00	113.50	09/03/10 (R)	18/05/10 (SF)	18/05/10 (IS)					
PN1703	**PN1704**	-	141.50	99.50	12/03/10 (IS)	21/03/10 (R)						
VA9571	VC0475	MIPMDF6JNB01KPST	154.43	110.57	12/03/10 (R)	01/04/2010 (NP)	02/04/10 (R)	24/04/10 (IS)	01/05/10 (SF)	01/05/10 (R)	18/05/10 (IS)	
VA4959	VA4960	-	168.00	118.00	12/03/10 (R)							
PN1738	**PN1739**	-	141.50	101.00	12/03/10 (R)	08/04/10 (R)						
VA2374	VA2375	-	153.00	106.50	12/03/10 (NS)							
VA5821	79821	-	158.00	115.00	12/03/10 (R)	31/03/10 (SF)	01/04/10 (SF)	09/05/10 (SF)				
PN1595	**PN1596**	-	146.50	107.50	13/03/10 (R)							
79391	79392	-	150.00	114.50	13/03/10 (R)	29/04/10 (IS)						
VA3212	**PN1740**	-	155.70	112.20	13/03/10 (R)	23/03/10 (R)	02/04/10 (IS)	12/04/10 (IS)	21/04/10 (IS)			
PN1730	**PN1731**	-	132.50	100.00	14/03/10 (R)							
79145	VC0330	**985121020433304**	155.00	115.00	15/03/10 (SF)	01/04/10 (SF)	02/04/10 (SF)	07/05/10 (SF)	07/05/10 (R)			
PN1051	PN1052	-	146.00	111.00	15/03/10 (R)							
PN1720	VA9606	-	154.43	-	15/03/10 (SF)	16/03/10 (R)	05/04/10 (R)					
PN1706	**PN1707**	-	145.00	112.50	16/03/10 (R)	24/04/10 (IS)						
VA0753	VA4170	-	143.00	110.00	16/03/10 (R)							
VA9217	VA9218	-	142.20	107.00	16/03/10 (R)							
-	**PN1749**	**985121020551381**	143.00	104.50	17/03/10 (R)	06/04/10 (NS)	12/05/10 (IS)					
PN1743	**PN1744**	-	149.00	-	17/03/10 (NS)							
PN1712	**PN1713**	-	151.00	111.50	17/03/10 (NS)	14/05/10 (NS)	23/05/10 (IS)					
V2961	**PN1705**	-	167.00	119.00	17/03/10 (IS)	23/04/10 (NS)						
76195		-		-	18/03/10 (SF)	18/03/10 (IS)						
VA1766	VA1767	**985121020483469**	147.00	115.00	18/03/10 (R)	27/03/10 (SF)	27/03/10 (SF)	26/05/10 (IS)				
V4659	VA5016	-	154.00	-	18/03/10 (NS)							
79223	79224	**985121020431223**	166.00	118.50	18/03/10 (R)	18/04/10 (IS)	29/04/10 (R)					
VC3129	**PN1831**	-	159.00	117.00	18/03/10 (R)	28/03/10 (R)	07/04/10 (R)	24/04/10 (SF)	24/04/10 (SF)	03/05/10 (IS)	21/05/10 (SF)	21/05/10 (SF)
PN1724	**PN1725**	-	150.00	109.00	18/03/10 (R)	24/04/10 (NS)						
PN1750	**PN1751**	-	145.00	105.00	18/03/10 (NS)	16/04/10 (R)	-	-				
VA3564	-	-	-	-	19/03/10 (SF)	10/04/2010 (R)	29/04/10 (IS)	09/05/10 (NP)				
PN1732	**PN1733**	-	149.00	106.50	19/03/10 (R)	16/04/10 (R)	-	-				
VA8633	VA1753	-	154.50	115.00	20/03/10 (R)	28/03/10 (R)	23/04/10 (IS)	09/05/10 (R)				

VA8698	VA8696	**985121020545950**	146.50	105.50	21/03/10 (R)	08/04/10 (R)	24/04/10 (IS)	11/05/2010 (R)				
PN1715	**PN1716**	-	154.00	109.00	21/03/10 (R)	09/04/10 (R)	-	-				
VA4214	VA4215	-	157.00	112.50	21/03/10 (R)	01/04/10 (R)	08/04/10 (R)	17/04/10 (NS)	23/05/10 (NS)			
VA3270	**PN1900**	-	139.50	97.25	21/03/10 (R)	18/04/10 (R)	-	-				
VA7571	VC0475	-	174.00	116.50	21/03/10 (R)	-	-	-				
PN1665	77700	-	155.00	113.00	21/03/10 (R)	01/04/10 (R)	-	-				
VA3206	VA3207	-	-	-	22/03/10 (SF)	-	-	-				
VA9596	VA5839	-	156.00	113.88	22/03/10 (R)	10/04/2010 (R)	28/04/10 (IS)	06/05/10 (NS)				
VA4140	-	-	-	-	22/03/10 (IS)	-	-	-				
VA1176	**PN1728**	-	155.00	110.00	23/03/10 (R)	-	-	-				
PN1373	VA3644	-	153.00	110.00	23/03/10 (R)	03/04/10 (R)	21/04/10 (NS)	-				
VC1063	VC1061	-	141.00	102.00	23/03/10 (NS)	26/05/10 (IS)	-	-				
VC0030	VC0031	-	151.50	106.50	24/03/10 (R)	04/04/10 (R)	25/04/10 (IS)	-				
PN1714	VC0460	-	157.00	111.00	24/03/10 (R)	31/03/10 (SF)	02/04/10 (R)	29/04/10 (R)				
PN1852	**PN1853**	-	146.00	105.00	24/03/10 (R)	03/04/10 (R)	29/05/10 (NP)	-				
PN1866	**PN1867**	**985121020547189**	147.50	108.00	24/03/10 (R)	03/04/10 (R)	21/05/10 (IS)	-				
PN1747	VA1868	-	147.00	95.00	24/03/10 (NP)	25/03/10 (R)	-	-				
76014	76015	-	166.00	118.00	25/03/10 (R)	-	-	-				
VC0235	VC0236	-	163.00	117.00	25/03/10 (R)	01/05/10 (NS)	-	-				
VA1545	VA1546	-	145.50	104.50	25/03/10 (R)	25/04/10 (R)	-	-				
VA8991	**PN1729**	-	148.00	106.00	25/03/10 (R)	-	-	-				
VC0245	VA4394	-	146.50	109.50	25/03/10 (R)	06/04/10 (NS)	-	-				
PN1870	**PN1871**	-	155.00	110.00	25/03/10 (R)	-	-	-				
V2424	**PN1868**	-	152.00	110.00	26/03/10 (R)	-	-	-				
D10241	D10240	**985121020485525**	150.00	106.50	26/03/10 (NP)	05/04/10 (R)	20/04/10 (IS)	02/06/10 (IS)				
PN1806	**PN1807**	-	156.00	112.00	26/03/10 (R)	06/04/10 (R)	23/04/10 (R)	-				
PN1765	VA8314	-	-	-	26/03/10 (R)	-	-	-				
VA5838	VA1448	-	164.00	112.00	26/03/10 (R)	04/04/10 (NS)	-	-				
PN1810	**VC1201**	-	146.00	105.00	26/03/10 (R)	30/04/10 (NP)	30/04/10 (NP)	29/05/10 (R)				
VA5004	**PN1721**	-	155.00	107.50	27/03/10 (R)	04/04/10 (R)	20/04/10 (R)	07/05/10 (IS)				
VA9079	VC0302	-	143.50	110.00	27/03/10 (R)							
VA4774	VA4775	**985121020545944**	154.00	111.00	27/03/10 (R)	14/04/10 (R)	23/04/10 (IS)	11/05/10 (NP)	12/05/10 (IS)	20/05/10 (IS)		
VC0419	VC0423	-	142.00	113.50	27/03/10 (SF)	29/04/10 (IS)						
PN1872	**PN1873**	-	147.00	111.00	28/03/10 (R)							
PN1854	**PN1855**	**985121020473794**	146.00	109.00	28/03/10 (R)							
PN1786	**PN1787**	-	141.50	105.00	28/03/10 (R)	07/04/10 (R)	11/04/10 (R)					
PN1764	VA9303	-	161.50	115.50	28/03/10 (R)	07/04/10 (R)	24/04/10 (R)	03/05/10 (R)	11/05/10 (NP)			

PN1876	**PN1877**	-	147.00	106.50	29/03/10 (R)	25/04/10 (NS)						
VA3247	**PN1828**	-	147.00	110.00	29/03/10 (R)							
VA9604	VA9624	-	153.00	112.50	29/03/10 (NS)	15/04/10 (IS)						
VA8969	VA8872	-	146.00	107.00	29/03/10 (NP)	19/05/10 (NS)						
VA4124	VA4123	-	158.00	111.00	29/03/10 (R)							
PN1848	**PN1849**	-	140.50	105.50	29/03/10 (R)	20/04/10 (R)	29/04/10 (R)					
PN1856	**PN1857**	-	141.00	106.00	30/03/10 (R)							
79371	**PN1735**	-	156.00	109.50	30/03/10 (R)							
VA6211	VA6212	-	159.00	110.00	30/03/10 (R)							
VC0333	VC0334	-	-		30/03/10 (NS)							
A9565	79083	-	146.50	112.50	30/03/10 (R)							
PN1663	70130	-	142.00	105.00	30/03/10 (R)							
VA3149	VA3148	-	161.00	111.50	30/03/10 (R)	09/04/10 (R)						
VA4879	VA1077	-	153.00	112.00	30/03/10 (R)	08/04/10 (SF)						
PN1752	**PN1753**	-	149.00	113.00	30/03/10 (R)	21/04/10 (R)						
78691	VA2262	-	151.00	111.00	30/03/10 (R)							
-	**PN1711**	-	150.00	97.00	30/03/10 (R)							
VA4893	VA4894	**985121020553522**	160.00	114.50	31/03/10 (R)	29/04/10 (R)	08/05/10 (IS)					
PN1819	**PN1818**	-	160.00	108.00	31/03/10 (R)	19/04/10 (R)						
PN1864	**PN1865**	-	149.00	103.00	31/03/10 (NP)							
VC0295	VA4823	-	-	100.00	01/04/10 (NS)							
PN1846	**PN1847**	**985121020514793**	145.00	102.50	01/04/10 (R)	18/04/10 (R)	14/06/10 (R)					
PN1776	**PN1777**	-	152.50	111.00	01/04/10 (R)	19/04/10 (IS)						
VA5457	VA9311	-	156.00	119.00	01/04/10 (SF)	01/04/10 (R)	26/04/10 (R)					
VA8040	VA8041?	-	145.00	106.00	01/04/10 (R)							
69575	D7535	-	150.50	114.00	01/04/10 (R)	02/05/10 (R)						
VA1859	**PN1834**	-	146.00	108.00	01/04/10 (R)							
VA5970	D7552	**985121020515671**	155.00	113.00	01/04/10 (NS)	27/05/10 (IS)						
PM0307	PM0310	**985121020512259**	152.00	107.75	01/04/10 (R)	29/04/10 (IS)	13/06/10 (R)					
PN1822	**PN1823**	-	136.00	104.00	01/04/10 (R)							
VC0005	VC0306	**985121020520476**	143.00	102.00	02/04/10 (R)	30/04/10 (R)	28/05/10 (R)					
PN1882	**PN1883**	**985121020547506**	163.00	123.00	02/04/10 (NS)	16/05/10 (R)						
PN1886	**PN1887**	**985121020547615**	154.50	115.00	02/04/10 (R)	28/04/10 (IS)	15/05/10 (R)					
PN1762	**PN1763**	**985121020504295**	152.50	114.00	02/04/10 (R)	10/06/10 (IS)						
PN1984	**PN1985**	-	149.00	110.00	02/04/10 (R)							
VC2105	VA5152	-	143.00	105.00	02/04/10 (R)							
PN1774	PM0634	-	144.00	104.00	03/04/10 (NS)	28/04/10 (R)						
PN1770	**PN1771**	-	136.00	108.00	03/04/10 (SF)	14/04/10 (R)	05/05/10 (NP)	06/06/10 (NS)				

VA4455	VA4456	-	148.50	-	03/04/10 (R)	21/04/10 (SF)	22/04/10 (IS)					
PN1768	**PN1769**	**985121020484226**	153.50	111.50	03/04/10 (R)	09/04/10 (SF)	22/04/10 (NS)	11/05/10 (IS)				
PN1708	**PN1709**	-	144.00	108.00	03/04/10 (R)							
VA9509	79354	-	168.00	114.00	03/04/10 (IS)							
PN1874	**PN1875**	-	150.50	109.50	04/04/10 (R)	01/05/10 (R)						
VA9185	VA9193	-	159.00	115.75	04/04/10 (R)	17/05/10 (NS)						
VA4335	V2718	**985121020557948**	147.50	107.00	04/04/10 (R)	15/04/10 (R)	24/04/10 (R)	22/05/10 (IS)				
PN1808	**PN1809**	-	151.50	110.50	04/04/10 (R)							
PN1884	**PN1885**	-	148.50	108.00	05/04/10 (R)	25/04/10 (IS)						
V2128	**PN1837**	-	143.00	109.25	05/04/10 (R)	15/04/10 (R)						
VC0134	VC0135	**985121020477893**	155.00	110.67	05/04/10 (R)	09/05/10 (R)	17/05/10 (R)?					
VA5811	VC0457	**985121020559555**	149.00	110.00	05/04/10 (R)	21/04/10 (R)	29/04/10 (SF)	25/05/10 (IS)				
VC0382	VA5875	-	150.50	116.00	05/04/10 (R)							
VA3243	VA2369	-	143.00	115.50	05/04/10 (R)							
PN1796	**PN1797**	**985121019401393**	141.00	99.00	05/04/10 (R)							
PN1789	VA4184	**985121020444100**	146.50	113.00	05/04/10 (R)	16/04/10 (R)	07/05/10 (R)	28/05/10 (NS)				
VA5872	VA0180	131929765A	149.00	107.00	05/04/10 (R)	19/05/10 (IS)						
VA3947	PN1828	-	148.50	108.00	06/04/10 (R)							
V2261	PN1705	-	167.00	118.00	06/04/10 (R)							
PN1780	-	-	146.50	109.00	06/04/10 (R)							
PN1718	-	-	155.50	114.00	07/04/10 (R)	29/04/10 (IS)						
79538	69513	**985121020477916**	153.00	116.50	07/04/10 (R)	29/05/10 (R)						
79249	79252	-	159.50	116.00	07/04/10 (R)							
VA9476	VA9477	-	142.75	105.38	07/04/10 (R)	16/04/10 (R)	03/05/10 (IS)	31/05/10 (IS)				
VC0126	VC0127	-	134.00	100.50	08/04/10 (R)							
PN1784	**PN1785**	-	148.00	110.50	08/04/10 (R)	16/04/10 (R)	17/05/10 (R)					
PN1782	-	-	146.50	111.00	08/04/10 (R)	08/05/10 (SF)						
VA1916	-	-	-	-	08/04/10 (R)							
PN1900	VA3270	-	140.00	99.00	08/04/10 (R)							
V2242	**VC3242**	**985121020472107**	143.00	108.50	08/04/10 (NS)	23/06/10 (IS)						
PN1748	-	**985121020435119**	131.50	97.00	08/04/2010 (R)	25/04/10 (NS)	26/04/10 (SF)	26/04/10 (IS)	05/05/10 (SF)	16/05/10 (IS)	26/05/10 (R)	05/06/10 (R)
CH1966	-	-	-	-	08/04/10 (NS)							
-	VA7598	-	144.00	118.00	09/04/10 (R)							
PM0617	PM0618	**985121020555786**	148.00	106.00	09/04/10 (SF)	08/05/10 (IS)	04/06/10 (NS)					
VA6929	VA6928	-	151.00	111.00	09/04/10 (IS)	28/04/10 (IS)						
PN1078	PN1001	-	150.00	109.00	09/04/10 (NS)							
PN1794	-	-	148.00	108.00	09/04/10 (R)	04/06/10 (R)						

PN1826	-	-	138.00	105.00	09/04/10 (R)								
VC1060	VC1059	-	-	-	09/04/10 (SF)	10/04/10 (SF)	20/04/10 (SF)						
PN1878	**VC2098**	-	151.00	111.50	10/04/10 (R)	25/04/10 (R)	24/05/10 (IS)	02/06/10 (NS)					
VA2576	VA4755	-	148.00	108.00	10/04/10 (R)								
-	VA1483	-	145.50	104.50	10/04/10 (R)								
-	VA5006	-	147.00	108.00	10/04/10 (R)								
PN1775	-	-	138.00	102.00	10/04/10 (R)	24/04/10 (SF)							
VA4185	V2137	-	163.00	114.00	10/04/10 (SF)								
VA9695	-	-	-	-	10/04/10 (SF)								
PN1766	-	1C5FK43E558E5pQD	165.00	108.00	11/04/10 (R)	23/06/10 (IS)							
VA4202	VA4206	-	151.00	107.00	11/04/10 (R)								
PN1894	PN1895	-	150.00	109.00	11/04/10 (R)								
PN1719	-	-	144.00	106.00	12/04/10 (R)								
PN1827	-	-	135.00	110.00	12/04/10 (R)								
D8034	D8035	-	160.00	116.00	12/04/10 (R)								
PN1833	-	-	147.00	101.00	12/04/10 (R)								
VA3264	VA4091	-	143.00	101.00	13/04/10 (R)								
VA9548	VA5409	-	160.00	118.00	13/04/10 (R)	04/06/10 (IS)							
PN1850	-	-	146.00	103.00	13/04/10 (R)								
VA5390	VA5673	-	142.00	109.00	14/04/10 (SF)	15/04/10 (R)							
PN1862	-	-	153.00	111.00	14/04/10 (R)								
VA9213	VA6883	-	157.00	106.00	14/04/10 (R)								
PN1851	-	-	-	-	14/04/10 (NS)								
PM0615	PM0616	-	152.00	110.00	14/04/10 (NS)	24/04/10 (NS)	14/05/10 (NS)						
PN1860	PM0691	-	151.00	117.00	14/04/10 (IS)	21/05/10 (IS)							
PN1745	PN1746	**985121020475530**	158.00	114.50	14/04/10 (IS)	04/05/10 (R)	13/05/10 (IS)						
VA3296	77217	-	159.00	-	14/04/10 (IS)								
PN1863	**VC2173**	**985121020514846**	150.00	107.00	14/04/10 (R)	15/05/10 (IS)	25/05/10 (R)						
PN1835	-	-	159.00	113.00	15/04/10 (R)								
PN1788	-	-	152.00	119.00	15/04/10 (R)								
VA1048	78706	-	162.00	115.00	15/04/10 (R)								
PN1858	-	-	142.00	98.00	15/04/10 (NS)								
VC0466	-	-	153.50	108.50	15/04/10 (R)	14/05/10 (R)							
PN1829	-	-	146.00	101.00	15/04/10 (R)								
PN1790	-	-	151.00	111.00	15/04/10 (R)	24/04/10 (SF)	26/05/10 (NS)						
VA9437	VC1161	-	140.00	105.00	16/04/10 (IS)								
CH1533	CH1534	**985121020486361**	155.00	112.50	16/04/10 (R)	30/04/10 (SF)	30/04/10 (R)	28/05/10 (SF)	28/05/10 (IS)				
VA3545	VA3546	-	152.00	109.00	16/04/10 (NS)								

PN1769	VA9303	-	161.00	115.00	16/04/10 (NS)								
PN1859	-	-	162.00	117.00	16/04/10 (R)								
VA8641	VA5844	-	153.50	108.50	16/04/10 (R)								
VC1014	VC1012	-	163.00	103.00	17/04/10 (R)								
PN1861	-	-	144.00	102.00	17/04/10 (SF)								
VA3882	VC0444	-	148.00	106.00	17/04/10 (R)	26/04/10 (R)	05/05/10 (R)	13/05/10 (IS)					
-	VA4325	-	157.00	114.00	17/04/10 (NS)	26/04/10 (IS)							
PN1159	PN1150	-	147.00	98.00	17/04/10 (NS)								
PN1756	**VC2038**	-	146.50	106.00	17/04/10 (IS)	27/07/10 (NS)							
PN1843	-	-	143.00	106.00	18/04/10 (IS)								
VA2182	PN0561	**985121020469951**	161.00	112.00	18/04/10 (IS)	02/06/10 (IS)							
VA4057	VA4056	-	108.00	-	19/04/10 (IS)	09/05/10 (SF)							
PM0646	PM0645	-	147.00	108.50	19/04/10 (IS)								
PN1888	VA5489	-	149.00	108.00	19/04/10 (R)	23/05/10 (NS)							
VA9379	VA5494	-	-	-	19/04/10 (NS)	16/05/10 (R)							
VA4721	*	-	150.00	112.00	19/04/10 (IS)								
PM0624	PM0625	-	163.00	115.00	19/04/10 (IS)								
-	VC1090	-	158.00	115.00	19/04/10 (R)	02/06/10 (NS)							
VA9382	-	-	142.00	105.00	19/04/10 (R)								
VC1169	CH4269	-	158.00	115.00	19/04/10 (R)	01/05/10 (R)	05/06/10 (R)						
VA4093	VA4092	-	151.75	113.75	20/04/10 (NS)	23/06/10 (NS)							
VA7919	VA7918	-	136.50	102.00	20/04/10 (IS)								
PN1892	-	-	148.00	109.00	20/04/10 (R)								
PN1654	-	-	139.00	104.00	20/04/10 (R)	29/04/10 (IS)							
VA5608	VA5609	-	-	-	20/04/10 (SF)								
PM0344	PM0345	-	149.00	106.00	20/04/10 (IS)								
PN1890	-	-	149.00	117.00	20/04/10 (IS)								
VA4747	VA4780	-	144.00	109.50	20/04/10 (IS)								
VA9536	PM0642	**985121020205530**	153.50	109.00	21/04/10 (R)	02/05/10 (R)							
PN1602	-	-	144.00	107.00	21/04/10 (IS)	11/05/10 (NP)	12/05/10 (IS)						
VA4868	-	-	160.00	111.00	21/04/10 (SF)	21/04/10 (NS)							
PN1891	**VC2063**	-	158.00	114.50	21/04/10 (R)	21/05/10 (R)							
PN1759	-	-	159.00	107.00	21/04/10 (IS)								
VA9591	-	-	149.00	107.00	21/04/10 (R)	30/04/10 (R)	08/05/10 (R)						
VA5247	PN1828	-	148.00	107.00	22/04/10 (IS)								
PN1842	-	-	149.00	115.00	22/04/10 (IS)								
PN1879	VA5018	-	153.00	114.00	22/04/10 (R)								
VA5837	VA1018	-	162.00	110.00	22/04/10 (R)	11/05/10 (NS)							

VA2399	VA2398	NQULKFLJ7H3P1T35	154.00	114.00	23/04/10 (IS)	29/05/10 (IS)						
VC0651	VC0652	-	149.00	109.50	23/04/10 (IS)	20/05/10 (R)						
PN1896	-	-	137.00	103.00	23/04/10 (NS)							
VA4829	VA4350	**985121020471565**	165.50	116.50	23/04/10 (IS)	13/06/10 (R)						
VA3583	-	-	160.00	116.00	23/04/10 (SF)	23/04/10 (NS)						
PM0661	PM0662	-	-	-	23/04/10 (SF)	02/05/10 (SF)						
PM0608	PM0619	-	155.00	110.50	23/04/10 (IS)							
PM0598	**VC2031**	**985121020551404**	144.00	106.25	24/04/10 (R)	25/05/10 (IS)						
VC0416	VC0417	-	141.00	-	24/04/10 (SF)							
79153	79154	**985121020475025**	142.00	108.00	24/04/10 (SF)	11/05/10 (IS)						
PN1840	**VC2037**	**985121020515584**	145.50	103.00	24/04/10 (SF)	25/05/10 (R)						
PM1745	PM1746	-	159.00	105.00	24/04/10 (IS)							
PN1757	**VC2020**	**985121020431427**	144.00	104.00	24/04/10 (IS)	13/05/10 (R)						
VA5825	79150	**985121020517830**	152.00	114.00	25/04/10 (R)	21/06/10 (R)						
PN1897	-	-	132.00	105.00	25/04/10 (R)							
PN1844	-	-	138.00	111.00	25/04/10 (IS)							
VA2184	VA2185	**985121020475003**	131.67	107.17	25/04/10 (SF)	25/04/10 (R)	07/05/10 (NP)	07/05/10 (IS)	08/07/10 (NS)			
VA9004	VC0050	-	147.00	105.00	26/04/10 (IS)							
VA7974	VA7975	-	169.50	111.50	26/04/10 (IS)							
PN0623	CV1084	-	153.00	-	26/04/10 (SF)							
VA4346	VA4347	-	151.00	109.00	26/04/10 (R)							
PN1722	-	-	144.00	103.00	26/04/10 (IS)							
VA2759	VA2760	-	137.00	102.00	26/04/10 (IS)							
PN1723	**VC2104**	-	146.50	107.00	26/04/10 (R)	25/05/10 (IS)						
PN1898	**VC2172**	**985121020471695**	143.00	101.00	26/04/10 (R)	22/05/10 (IS)						
VA3476	VC0488	**985121020472801**	157.50	114.50	26/04/10 (R)	24/05/10 (IS)	02/06/10 (NS)					
PN1813	**VC2035**	**985121020479917**	133.50	101.00	27/04/10 (R)	06/05/10 (SF)	28/05/10 (R)					
VC0013	VC0014	-	153.50	116.50	27/04/10 (R)	06/05/10 (R)						
79440	79441	127115293A	162.00	116.00	27/04/10 (IS)	25/05/10 (IS)						
PN1889	-	-	148.00	109.00	27/04/10 (NS)							
VA5919	VA9900	-	160.00	120.00	27/04/10 (R)							
VA9462	VA4211	-	-	-	27/04/10 (SF)							
PN1869	-	-	-	-	27/04/10 (NP)							
VA2473	VA2474	-	145.00	107.00	28/04/10 (IS)							
VA3541	VA3452	-	146.50	108.50	28/04/10 (R)	07/05/10 (R)						
VA4010	VA4009	-	153.50	114.50	28/04/10 (R)	21/06/10 (NP)						
VA7917	VA7918	-	-	-	28/04/10 (NS)							
PN1899	-	-	153.50	111.00	28/04/10 (R)							

VA2329	PM0672	-	153.50	114.50	28/04/10 (IS)	06/05/10 (NS)							
VA4142	VA4141	-	145.00	110.00	28/04/10 (R)								
VA4841	VA4842	**985121020477918**	156.00	106.00	28/04/10 (R)								
PN1043	**VC2036**	-	151.00	108.50	28/04/10 (IS)	28/05/10 (NS)							
79369	79370	-	157.00	116.50	28/04/10 (NS)	08/05/10 (R)							
79927	79926	-	159.00	115.00	28/04/10 (R)								
PN0645	PN0646	-	145.50	107.50	28/04/10 (IS)								
PN1841	**VC2127**	**985121020441774**	155.00	113.00	29/04/10 (IS)	22/06/10 (IS)							
PN1814	-	**985121020551458**	144.50	109.00	29/04/10 (NS)	17/05/10 (IS)							
PN1793	-	**985121020482387**	144.50	108.50	29/04/10 (IS)	26/05/10 (IS)							
VC0494	VA2714	-	165.50	112.25	29/04/10 (IS)	18/05/10 (NS)							
VA9600	VA3615	-	162.00	112.00	29/04/10 (IS)	19/05/10 (NS)	23/06/10 (SF)						
PN1798	-	-	149.00	108.00	29/04/10 (IS)	17/05/10 (IS)							
PM0345	PM0344	-	152.00	106.00	29/04/10 (R)	10/05/10 (IS)							
PN1845	-	-	149.00	106.00	30/04/10 (R)								
VC0296	VC0297	**985121020510019**	145.50	109.00	30/04/10 (R)								
VA9591	-	-	149.00	107.00	21/04/10 (R)								
V2224	V2225	-	143.00	-	30/04/10 (SF)								
PN1792	-	**985121020547219**	144.00	105.00	30/04/10 (R)								
VA5714	VA5715	**985121020551436**	-	-	30/04/10 (R)	30/05/10 (R)							
PN1783	**VC2155**	-	141.00	104.50	01/05/10 (R)	19/05/10 (IS)	29/05/10 (NS)						
PN1761	-	**985121020547285**	144.50	104.00	01/05/10 (R)	31/05/10 (NP)							
VA7938	VA7939	-	153.50	113.50	01/05/10 (R)								
-	VA1869	**985121020431154**	158.00	116.00	02/05/10 (R)	22/05/10 (R)	01/06/10 (IS)						
VA3201	VA3203	-	173.00	119.00	02/05/10 (R)	12/05/10 (R)							
PN1817	-	-	153.50	144.00	03/05/10 (IS)								
PN1760	**VC2028**	**985121020433049**	139.50	106.00	03/05/10 (R)	19/05/10 (NP)	20/05/10 (R)						
VC1621	VC1622	-	-	-	03/05/10 (R)								
VC0401	VA5889	**985121020512806**	150.75	106.25	03/05/10 (R)	22/05/10 (IS)							
PN1758	-	**985121020479955**	148.00	108.50	03/05/10 (IS)								
VA4862	VA4864	-	152.00	110.00	03/05/10 (R)								
VA9614	VA9625	-	153.00	106.00	03/05/10 (R)								
PN1652	-	-	159.00	117.00	03/05/10 (IS)								
IV00466	-	-	154.00	110.00	04/05/10 (R)								
VC1162	VC1163	-	154.50	110.00	04/05/10 (R)	15/05/10 (NS)							
VA8037	-	**985121020429133**	143.00	104.00	04/05/10 (R)	21/05/10 (IS)							
PN1754	-	-	162.00	115.00	04/05/10 (R)								
VA4114	VA4215	-	-	-	04/05/10 (R)								

VC0396	8067	-	155.00	113.00	04/05/10 (R)							
PN1653	-	-	-	-	05/05/10 (SF)							
VC1117	VA4111	-	151.00	113.00	05/05/10 (R)							
VC2078	**VC2002**	**985121020474909**	142.00	103.00	06/05/10 (R)							
79340	79341	-	-	-	06/05/10 (SF)							
VC0262	-	**985121020516413**	153.50	114.50	06/05/10 (SF)	06/05/10 (R)	27/05/10 (R)					
PM0641	-	132231614A	149.00	106.00	06/05/10 (R)	17/05/10 (NP)	25/06/10 (IS)					
VC2009	-	-	-	-	06/05/10 (SF)							
PM0666	PM0667	-	145.00	103.00	06/05/10 (NS)	11/06/10 (R)						
VA8797	VA9613	-	157.00	111.00	07/05/10 (R)							
VC2005	**VC2006**	No PIT	147.00	104.50	08/05/10 (R)	18/05/10 (NS)						
79488	79489	132271646A	147.00	114.00	08/05/10 (NS)							
VC1139	VA4867	**985121020427866**	155.25	114.00	08/05/10 (R)	20/05/10 (IS)						
VC2107	**VC2108**	**985121020520678**	158.00	111.00	08/05/10 (R)							
VC0480	VC0482	**985121020480865**	141.00	106.00	08/05/10 (R)							
PN1838	**PN1839**	-	141.00	110.00	08/05/10 (R)	16/06/10 (SF)						
VA9282	VA9283	**985121020520398**	153.50	108.00	08/05/10 (IS)	16/05/10 (IS)						
PM0632	PM0633	**985121020555276**	165.50	122.50	08/05/10 (R)	17/05/10 (IS)						
VC2018	-	-	-	-	09/05/10 NS							
VC0312	**VC2125**	**985121020561506**	136.00	101.00	01/05/2010 (R)	09/05/10 (SF)	10/05/10 (IS)	19/05/10 (R)	19/06/10 (R)			
V2102	-	-	-	-	09/05/10 (SF)							
VC0323	VC0324	**985121020475524**	140.00	106.75	09/05/10 (NS)	19/05/10 (IS)	06/06/10 (NS)	15/06/10 (R)				
VA5904	VA5905	-	158.00	126.00	10/05/10 (R)							
PM0643	PM0649	-	-	-	10/05/10 (NP)	06/06/10 (IS)						
PM0640	V4554	-	152.00	109.00	10/05/10 (SF)	28/05/10 (IS)						
VC2109	**VC2110**	-	137.50	100.50	10/05/10 (R)	03/07/10 (NS)						
VC2016	-	**985121020475195**	150.00	108.00	10/05/10 (R)							
PN1801	VA9305	**985121020561446**	144.00	106.00	10/05/10 (NS)	19/05/10 (R)	29/05/10 (NP)					
VC3116	PM0660	-	137.00	99.00	11/05/10 (R)							
VC2117	**VC2118**	-	154.00	108.50	11/05/10 (NS)	12/05/10 (SF)						
PN1832	VC1227	-	155.00	105.00	11/05/10 (IS)							
VA8423	VA8422	-	146.00	109.00	11/05/10 (IS)							
VA4874	VC0257	-	154.00	106.00	12/05/10 (IS)							
VC2124	-	-	-	-	13/05/10 (NS)							
VC2023	**VC2024**	6KQCA9024KM1AUJ3	145.00	107.00	13/05/10 (R)	23/05/10 (R)						
VA9454	-	-	-	-	14/05/10 (SF)	14/05/10 (SF)						

-	VA4728	**985121020443694**	157.00	114.00	14/05/10 (IS)								
VA5834	VA5874	-	-	-	14/05/10 (R)								
VA8114	VA8113	-	-	-	15/05/10 (SF)	25/05/10 (NS)							
VC2099	**VC2100**	**985121020504532**	147.00	109.00	15/05/10 (IS)	24/05/10 (IS)							
VC2163	**VC2164**	-	146.00	105.00	15/05/10 (NS)								
PN1815	VA4381	-	151.00	107.00	15/05/10 (NS)								
VC2175	**VC2120**	**985121020506937**	-	-	15/05/10 (SF)	16/05/10 (IS)	27/05/10 (R)						
VA9408	**VC2156**	**985121020433511**	149.00	106.75	15/05/10 (NS)	03/06/10 (IS)							
VC2167	**PN2186**	-	-	-	15/05/10 (SF)	16/06/10 (NP)							
PM0655	**VC2021**	**985121020472936**	137.00	103.00	15/05/10 (R)								
VC2075	VC2076	-	138.50	102.50	16/05/10 (IS)	26/05/10 (NS)							
PM0657	PM0658	**985121020510677**	142.00	102.50	16/05/10 (IS)								
07769	07770	-	158.00	116.00	16/05/10 (IS)								
VC0321	VC0322	**985121020475829**	153.25	108.75	16/05/10 (NS)	21/06/10 (R)							
VC2029	**VC2030**	-	141.00	102.50	17/05/10 (R)								
PN1824	PN1825	**985121020512811**	166.00	116.25	17/05/10 (NP)	06/06/10 (IS)							
VC0473	-	-	-	-	18/05/10 (SF)								
VC2081	**VC2082**	**985121020511380**	152.00	110.00	18/05/10 (SF)	18/05/10 (R)							
VA1813	VA1814	-	151.00	111.00	18/05/10 (IS)								
VC2087	**VC2088**	-	150.00	106.00	18/05/10 (IS)								
PM0440	V4554	-	152.00	109.50	19/05/10 (IS)								
VC2013	**VC2014**	**985121020439939**	-	-	19/05/10 (R)								
VA4217	VA4218	**985121020488569**	155.00	114.00	19/05/10 (R)								
VA6846	VA7953	132135760A	145.50	105.00	19/05/10 (IS)	29/05/10 (IS)							
VC2051	**VC2052**	-	147.00	116.00	19/05/10 (R)								
PN1820	**PN1821**	-	145.00	108.50	19/05/10 (R)	29/05/10 (R)	17/06/10 (NP)						
VC2012	**VC2027**	JME586NC334GNFHS	146.50	105.00	19/05/10 (NS)	30/05/10 (IS)							
VA3463	VC0339	**985121020474202**	158.00	113.75	20/05/10 (IS)	29/05/10 (IS)	07/06/10 (R)	26/06/10 (R)					
VC2091	**VC2092**	-	147.00	110.50	20/05/10 (IS)								
VA9608	VA3615	-	157.50	109.00	20/05/10 (R)								
VA4324	VA4322	-	154.00	116.00	20/05/10 (NS)								
VA3551	-	**985121020441766**	164.00	114.00	20/05/10 (NP)	20/05/10 (IS)							
VC0010	**VC2170**	**985121020547535**	148.00	118.50	20/05/10 (IS)	30/05/10 (IS)							
VA4265	D8038	-	156.00	112.00	20/05/10 (NS)								
VC2061	**VC2062**	**985121020471365**	141.50	101.00	20/05/10 (IS)								
VA9618	-	-	-	-	20/05/10 (NS)								
VC2065	**VC2066**	-	144.00	105.00	20/05/10 (NS)								
VC2025	**VC2026**	-	140.00	104.00	21/05/10 (NS)								

PN1800	V2690	**985121020514461**	150.00	108.75	21/05/10 (R)	02/06/10 (R)							
VC2003	VC2004	-	150.00	107.00	21/05/10 (NS)								
VC0561	VC1683	-	153.00	102.00	21/05/10 (NS)								
VC3143	VC3144	-	160.00	118.50	21/05/10 (NS)								
VA8870	VA9005	-	137.00	104.00	21/05/10 (IS)								
VC2074	**VC2050**	-	145.00	109.00	21/05/10 (R)								
-	**VC2168**	**985121020439683**	157.00	116.00	21/05/10 (R)								
VC2095	**VC2096**	-	149.00	105.00	21/05/10 (IS)								
VC2019	VC3175	-	149.50	105.00	21/05/10 (IS)								
VA3129	PN1831	-	160.00	116.00	21/05/10 (SF)								
VA8985	VA8987	-	141.00	102.00	21/05/10 (R)								
79425	VC0168	**985121020441534**	166.00	121.00	22/05/10 (R)								
PN1657	PN1658	**985121020519780**	154.00	112.00	22/05/10 (R)								
VC2064	-	-	-	-	22/05/10 (SF)								
VC2089	**VC2090**	**985121020477974**	154.50	114.00	22/05/10 (IS)								
VA9616	VA9617	**985121020482844**	160.00	117.00	22/05/10 (R)								
VA2378	-	**985121020506122**	161.00	119.50	23/05/10 (IS)								
VC2057	**VC2058**	**985121020512774**	148.50	108.00	23/05/10 (IS)	02/06/10 (IS)							
VC2157	**VC2158**	**985121020443819**	156.00	116.00	23/05/10 (IS)								
VA4510	VA2061	**985121020442162**	146.00	107.50	23/05/10 (IS)								
VC2059	**VC2060**	**985121020559859**	147.00	110.00	23/05/10 (R)								
VC2079	**VC2080**	**985121020519125**	142.00	-	24/05/10 (R)								
VC2083	**VC2084**	**985121020429331**	173.50	124.00	25/05/10 (R)								
VC1017	VC1016	-	151.00	108.25	25/05/10 (NS)	03/06/10 (NS)							
VC2113	-	-	151.00	106.00	26/05/10 (IS)								
VC1009	-	-	155.00	121.00	26/05/10 (IS)								
VC2473	VC2474	**985121020519942**	144.50	107.00	26/05/10 (IS)								
PN0310	PM0307	-	-	-	26/05/10 (NS)								
VC0322	VC0321	-	153.00	110.00	26/05/10 (IS)								
VC0302	-	-	-	-	26/05/10 (NS)								
VA8858	VA8865	**985121020484612**	105.00	101.75	26/05/10 (R)	04/06/10 (NP)	04/06/10 (IS)						
VA7920	VA7921	-	149.00	111.00	26/05/10 (SF)	27/05/10 (NS)							
VC2053	**VC2054**	**985121020483785**	144.50	112.00	26/05/10 (R)	13/06/10 (R)							
79581	79580	**985121020516664**	149.00	108.00	26/05/10 (R)								
VC1705	VC1706	132715620A	138.00	108.00	27/05/10 (R)								
VC2161	**VC2162**	**985121020559568**	146.00	112.00	27/05/10 (IS)								
VC3152	PN1837	-	143.50	106.00	27/05/10 (R)								
VA7920	VA7921	-	149.00	111.00	26/05/10 (SF)	27/05/10 (NS)							

VA1185	VA3495	-	149.00	95.00	27/05/10 (NP)							
VA1421	VA1422	-	-	-	27/05/10 (NS)							
VC2159	**VC2160**	-	-	-	27/05/10 (R)							
PM0645	PM0646	-	146.00	107.50	27/05/10 (R)							
VC2033	**VC2034**	**985121020482157**	143.00	100.50	27/05/10 (NS)	07/06/10 (R)						
VC9571	VC0475	-	154.00	111.00	28/05/10 (IS)							
VA4822	VA4821	-	144.00	103.50	28/05/10 (IS)							
VA1427	VA1428	-	155.50	109.50	28/05/10 (IS)	05/06/10 (IS)						
VC2169	VA1802	**985121020510694**	148.00	107.00	28/05/10 (NS)	05/06/10 (R)						
VA6154	VA4660	-	158.00	118.00	28/05/10 (R)							
-	VA8050	-	159.00	114.00	28/05/10 (R)							
CH2513	CH2514	-	136.00	102.00	28/05/10 (R)							
VC2151	**VC2152**	**985121020504485**	148.00	107.00	29/05/10 (IS)							
VA4534	VA4635	-	-	-	29/05/10 (NS)							
VC0834	**VC0835**	-	140.00	106.00	29/05/10 (R)							
CAN430	CAN433	-	-	-	29/05/10 (NS)	01/07/10 (NS)						
VC2055	**VC2056**	**985121020432918**	145.00	106.00	30/05/10 (IS)							
VC2114	VC0652	**985121020431308**	151.00	110.00	30/04/10 (IS)							
VC2093	**VC2094**	-	146.50	105.50	31/05/10 (NS)	09/06/10 (IS)						
VA7940	VA7941	**985121020505750**	148.00	106.00	01/06/10 (IS)							
PN1802	**VC2177**	**985121020509194**	147.00	106.00	02/06/10 (NS)							
D10373	D10374	**985121020549777**	169.00	117.00	02/06/10 (IS)							
VC1020	VC1018	-	151.00	108.50	02/06/10 (R)							
VC2041	VC0259	**985121020443884**	151.00	117.00	03/06/10 (R)							
VC2174	PN1883	-	165.00	121.50	03/06/10 (IS)							
VC2085	**VC2086**	-	148.00	113.00	04/06/10 (R)							
VC2130	**VC2131**	-	-	-	05/06/10 (NS)							
VC2043	-	-	138.00	101.00	05/06/10 (NS)							
VC2101	**VC2116**	-	-	-	06/06/10 (IS)							
VC0146	VC0147	**985121020561375**	129.00	99.00	06/06/10 (IS)							
VC1775	VC1774	-	-	-	06/06/10 (NS)							
PN1873	PN1872	-	147.00	110.00	06/06/10 (R)							
VA2376	VA9537	-	-	-	06/06/10 (IS)							
VC2047	**VC2048**	**985121020433103**	144.00	106.00	07/06/10 (IS)							
VC2214	**VC2171**	-	151.00	115.50	07/06/10 (SF)	07/06/10 (NS)						
VC2153	**VC2154**	D1JLDUEGUTB48Q3P	160.50	120.00	07/06/10 (IS)							
PN2801	**PN2802**	-	160.00	114.00	09/06/10 (IS)							

VA3650	VA3651	**985121020520459**	154.00	110.00	11/06/10 (IS)								
VC1508	**VC1509**	-	-	-	11/06/10 (NS)								
PM0580	79812	-	157.50	118.00	12/06/10 (NS)								
VA4205	VA4206	**985121020513326**	152.50	110.50	20/06/10 (R)	30/06/10 (IS)							
VA9577	VC0475	-	-	-	07/06/10 (R)								
VC0202	VC1129	**985121020472799**	165.00	115.00	07/06/10 (IS)								
VA8106	VC1604	**985121020520488**	141.00	108.00	08/06/10 (IS)								
VC1241	V2122	-	154.50	113.50	08/06/10 (IS)								
VA9645	PM0639	**985121020480671**	141.00	101.00	13/05/10 (IS)	11/06/10 (IS)							
VC2106	-	**985121020551914**	152.00	107.50	14/06/10 (IS)								
VC2132	VC2050	-	-	-	23/06/10 (NS)								
VA9561	VA9567	**985121020507051**	159.00	116.00	16/06/10 (R)	27/06/10 (IS)							
VA5928	VA5876	**985121020433539**	149.00	113.00	29/06/10 (IS)								
VA3775	VA3777	-	159.00	107.00	29/06/10 (NS)								
-	VA3465	-	-	-	30/06/10 (NP)								
VC3153	**VC2126**	-	138.00	99.00	30/06/10 (SF)	01/07/10 (NS)							
79736	**VC2180**	**985121020506966**	153.00	110.00	13/07/10 (R)								
-	-	**985121020547518**	151.00	109.00	17/05/10 (R)								
PN1812	-	**985121020559525**	152.00	109.00	19/05/2010 (R)								
-	-	**985121020441556**	-	-	24/05/10 (R)								
PN1791	-	7KUBBMUJR70AVF1H	157.50	118.75	25/04/10 (NS)	25/05/10 (IS)							
-	-	**985121020437480**	159.00	119.00	25/05/10 (IS)								
PM0651	PM0694	**985121020509942**	161.00	115.50	09/06/10 (R)								
VC1203	VC3103	**985121020511523**	145.00	102.00	16/06/10 (R)								