# Predation on Green Turtle Nests: North West Cape

Ningaloo Turtle Program 2014–2015

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## 1.0 INTRODUCTION

The Department of Parks and Wildlife have been running a 1080 fox baiting program since 2004 to manage feral animal predation (particularly foxes and dogs) adjacent to important turtle rookeries on the North West Cape and in the Ningaloo Marine Park. Reliable estimates of predation by feral animals are essential to assess the effectiveness of the baiting program, with low levels of fox predation being an indicator of success. The Ningaloo Turtle Program (NTP) traditional methodology records incidences of predation and disturbances to all turtle nests monitored within the first 24 hours of nesting. Predation on older nests is only recorded opportunistically if observed whilst monitoring new nests and tracks, therefore some incidences may not be recorded. At present it is unclear whether nest predation over the entire incubation period may be underestimated because older nests are not specifically checked every day throughout the incubation period. This uncertainty has implications for estimating overall levels of feral predation, and the effectiveness of feral animal management.

Turtle nest predation was monitored during the 2014 - 15 turtle nesting season to assess the reliability of methodologies for estimating total predation levels currently used by the Ningaloo Turtle Program.

Hatching and emergence success were also monitored during the project to increase understanding of nesting in the Ningaloo region and build on previous studies. A sample of green turtle nests from the North West Cape Division were monitored daily throughout incubation until hatching using remote cameras and ground-truthing through visual observations each morning. Once the nests hatched, they were exhumed to examine the remaining contents.

The sample size was originally set at 30 nests, but due to a low level of turtle nesting, it was reduced to 20 nests so as all nests could be captured within a ten day period for ease of monitoring and subsequent exhumation. Green turtle nests were monitored so as to learn about incubation periods specifically for green turtles in this area and also because they are the most common species nesting adjacent to the North West Cape1080 baiting area. Cameras recorded the presence of predators in the vicinity of the nest and their activity. Volunteers also monitored the nests in the field each morning to check the camera security and placement, and to record prints or signs of nest disturbance based on visual observations.

The aims of the project were to:

1. Investigate the reliability of only using observations of predation in the first 24 hours after nesting (and subsequent opportunistic sightings) to estimating overall predation pressure during incubation
2. Assess the practicality and reliability of using remote cameras to assess predation on green turtle nests over their entire incubation period
3. Assess the ability of volunteers to identify presence and activity of predators by tracks and physical signs of nest disturbance only
4. Estimate hatching success of green turtles
5. Estimate emergence success of green turtles

# 2.0 METHODOLOGY

## 2.1 Turtle nest selection and setup

Nest sites were selected with considerations toward camera security thus eliminating areas near beach accesses or within sight from car parks. The following subsections were chosen (Figure 1):

- Jacobzs South – Wobiri (central section) WO 1 x Cameras
- Five Mile North (northern section) FM 2 x Cameras
- Brooks – Graveyards (central section) BR 2 x Cameras
- Graveyards – Burrows (central section) GY 7 x Cameras
- Burrows – Jurabi Point (complete section) BU 8 x Cameras

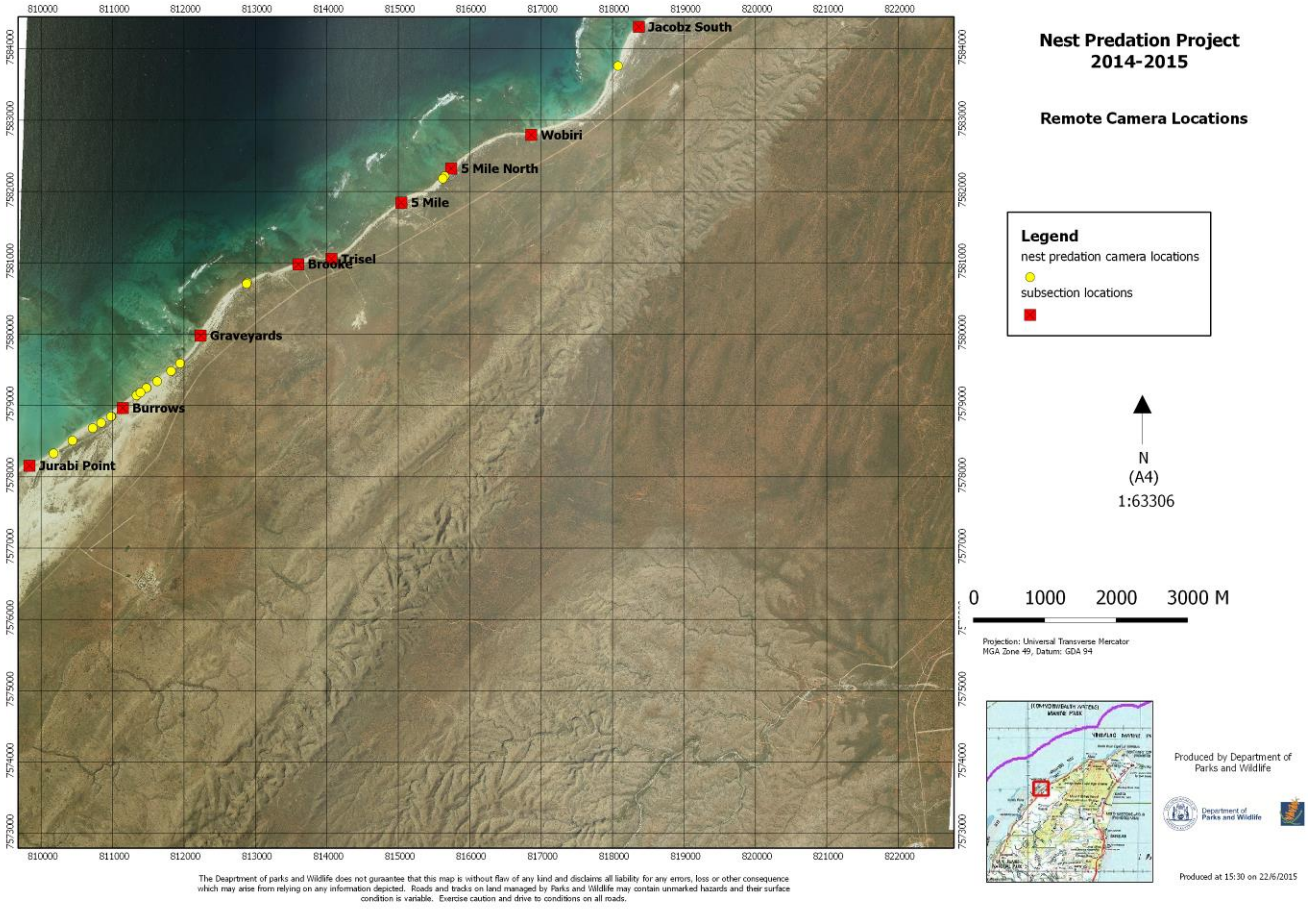


Figure 1: Remote camera locations

Based on previous research and observations, the nest incubation period was estimated at 60 days. Due to a combination of the length of incubation period and the low nesting density for the season, 20 nests were selected for the study within a ten day period (22/11/2014 to 01/12/2014) so as to make the study feasible with limited resources. The chosen subsections were monitored for suitable new green turtle nests (i.e. nests had to be

laid the previous night, were preferably in or close to the dune system, confidently identified as nests based on standard NTP methodology, and preferably had relatively obvious egg chamber locations). The GPS positions were recorded and Reconyx remote cameras were installed.

Cameras were placed 3m away from the egg chamber, facing approximately north-east where possible, in order to minimise lens exposure to the prevailing south-westerly winds. They were mounted on 2.1 metre star pickets, approximately 500mm above the ground level, using M8 threaded studs with a double plain nut to lock the unit in place. In addition, and primarily as a theft deterrent, cameras were also attached to the star picket with a crimped loop of stainless steel wire. The cameras were labelled as property of Parks and Wildlife, being used for turtle research, and asking the public not to interfere.

The location of the egg chambers were estimated only by experienced personnel, based on standard NTP monitoring methodology. A standard magnetic compass was then used to take a bearing from the camera's star picket to the estimated egg chamber, both distance and magnetic bearing recorded. Generally the distance was 3m and the magnetic bearing 135º. Information was recorded on the camera installation and daily monitoring datasheets (Appendix 1 and 2).

## 2.2 Remote cameras and track monitoring

Nests were monitored by remote heat activated cameras continuously from the 22/11/2014 (or when they were installed within the ten days after) until the 24/2/2014 or the date they were exhumed. In addition, nests were monitored in the field by direct observation most days between the 2/12/14 and 14/12/14 and then everyday between the 15/12/14 and 18/2/15 (unless nests hatched and were exhumed prior). External NTP volunteers monitored nests from 15/12/14 to 11/01/15 during their routine NTP monitoring. Monitoring entailed a basic observation of camera placement and integrity (i.e. camera was not missing, opened, etc.) as well as assessing the nests for any signs of disturbance and looking for prints/tracks within a 5 metre radius in front of the camera. This information was recorded on the daily monitoring datasheet (Appendix 2). In addition to daily checks, the cameras were serviced approximately every two weeks during which SD cards were changed, battery condition checked and the lenses were cleaned.

The reliability of cameras was assessed between the 12/1/14 and 18/2/15 due to some camera malfunctions and inaccuracies detected during the initial stages of monitoring. In the first two weeks of the survey four cameras were changed, three of these due to suspected unreliability (trigger failure) and the fourth due to malfunction (taking images at the same time on several mornings and evenings without apparent activity).
A further four cameras seemed to be unreliable and were therefore duplicated (an additional camera placed directly above or below the original camera on the same star picket) to allow a comparison between the images collected on each camera and hence

evaluate trigger success. In addition, remote camera photos were compared to field observation data (prints recorded within 5m of the camera) to assess trigger success. This in turn also allowed the accuracy of the observers' track identification skills to be assessed. Data were recorded on a camera integrity datasheet (Appendix 3).

### 2.3 Nest exhumation

From the 14th January 2015, twelve hatched nests were observed during daily monitoring of the survey nests in addition to the twenty with remote cameras. These additional twelve nests were exhumed to increase the sample sizes for estimating hatching and emergence success. Only nests showing conclusive signs of hatching were selected (i.e. nests with more than one set of clearly visible hatchling tracks emerging from the same place). These nests were marked with a cane inserted into the sand its own length inland from the hatched nest cone. Each nest was numbered and recorded (Appendix 4) along with the date of hatching, on flagging tape attached to the cane. A minimum of ten days from date of the first observations of hatching was allowed before these nests were exhumed to allow for adequate time for remaining hatchlings to emerge.

Exhumation of the camera nests was planned for at least ten days after the estimated date of hatching to ensure all viable hatchlings had left the nest. These dates were adjusted accordingly once actual signs of hatching were observed and then nests were exhumed between the 28/01/2015 and 18/02/2015. Assumption of hatching was based on observation of hatching tracks, the appearance of a hatched nest cone and an increase in gull and crab activity in the direct vicinity of the nest. When the nests hatched they were marked with a cane in order to ensure the chamber could be easily found after ten days. This cane was placed exactly its own length from the centre of the hatch area, with the hatch area in direct line between the cane and the camera trap. This allowed the accuracy of the distance and compass-bearing method (initially used to mark the nests) to be checked, whilst at the same time adding a second reference point to ensure easy location of the nest on the exhumation day.

Cameras were switched off and removed when the nests were exhumed. A bamboo cane was temporarily put in the place of the steel star picket to avoid any interaction between the steel and the compass whilst a bearing was taken to locate the egg chamber. A tape measure was used to estimate the 3 metre distance and a compass was held over it (at the cane end) to ensure the magnetic angle was correct. Once the estimated chamber location was determined, a cane was used to probe the sand for the exact chamber location. The resistance in pushing the cane through the sand would ease suddenly when the cane entered the empty space of the chamber. Due to the large depth of nest encountered with green turtles, a shovel was used to dig away the surface sand and level an area immediately surrounding the chamber area before exhumation began. A 20 litre plastic bucket with the bottom removed was then placed over the cane protruding from the chamber, the cane was removed and the sand inside the bucket was dug out (Figure 2). The bucket was pushed

deeper as needed, thus preventing the side walls from caving in and burying the chamber area. When the first egg shells were located a measurement was taken between this point and the surface sand to indicate the depth of the top of the nest. When the nest was fully exhumed another measurement was taken between the surface sand and the location of the last egg/s to indicate the bottom of the nest. Care was taken during the initial stages of digging as live (most likely unviable) hatchlings could still be encountered.

At least three people were involved during each exhumation: a recorder, a digger and someone sorting through the eggs and classifying them for the recorder. The datasheet used in the field was based on pre-existing exhumation methodology and is shown in Appendix 5. Exhumation data are summarised in Appendix 6. Biopsy samples were taken from dead hatchlings and stored in ethanol for a separate Department of Parks and Wildlife genetics study.


Figure 2: Nest excavation showing the marker cane, bucket in the sand and egg counting technique

## 2.4 Photo and data analysis

Photos were downloaded and saved each time the camera SD cards were changed. Once all of the nests were exhumed, the photos were analysed to summarise the presence and behaviour of predators (see examples in an excerpt from the completed photo analysis datasheet in Appendix 7). Behaviours were classified as follows:

- Ignored: Animal showed no interest in the nest
- Showed interest but no damage: interest demonstrated by sniffing/ observing location of the egg chamber
- Attempted dig/predation: predation attempt that was not successful/complete
- Successful predation of eggs/hatchlings: Confirmed by photographic evidence of eggs or hatchlings being consumed
- Accidental nest damage: i.e. by turtle digging up an existing nest, etc.

If an animal exhibited more than one behaviour type in one sequence of photos, only the most intrusive behaviour type was recorded. Due to the high numbers of seagulls frequenting the study area, only incidences of successful predation were recorded for this species.

Hatching and emergence success rates were calculated as with the following formulas from standard existing formulas (Appendices 4 & 6):

- Hatching success (%)=

$$\frac{\#\text{ empty shells}}{\#\text{empty shells} + \#\text{undeveloped eggs} + \#\text{unhatched eggs} + \#\text{unhatched full-term eggs} + \#\text{depredated eggs}} \times 100$$

- Emergence success (%)=

$$\frac{\#\text{ empty shells} - (\#\text{live} + \#\text{ dead hatchlings})}{\#\text{empty shells} + \#\text{undeveloped eggs} + \#\text{unhatched eggs} + \#\text{unhatched full-term eggs} + \#\text{depredated eggs}} \times 100$$

# 3.0 RESULTS

## 3.1 Remote cameras and track monitoring

During the survey there were several images taken of curious members of the public and others of passers-by. One camera was moved and had the SD card altered and another was opened. However this did not have a significant impact on the survey and there was no damage or theft of cameras.

Camera reliability varied greatly over the 21 day camera integrity study ranging from 0% to 100% based on comparisons between field observations and camera triggers. Overall trigger success was 55.7%, with individual camera trigger success averaging at 48% (Appendix 3).

The track identification skills of observers[1] in the field were estimated to be of 81.4% accuracy using comparisons between the field observations and the photographs. On 18 occasions cat prints were incorrectly recorded as 'positive' or 'uncertain' records of fox tracks. In all of these instances tracks occurred in soft dry sand and were viewed from behind the camera, with the main cue for identification being the distance between paw prints. There were some occasions when the cameras captured photographs but field observations were not noted due to the area being windblown or incorrectly assumed to be outside of the camera trigger zone.

## 3.2 Nest exhumation

The anticipated nest incubation period was initially predicted to be 60 days based on previous research relevant to green turtles in similar climatic conditions. Actual incubation periods of the 20 monitored nests ranged between 58 – 75 days, with an average of 68.7 days. Accordingly, nest exhumation was conducted within a 22-day period rather than the planned ten-day period.

Of the 20 nests observed, 16 were successfully exhumed (80%), 15 of which showed conclusive signs of hatching. The other five were affected by:

- 1x dune encroachment (estimated 8 metres over 40 days – nest not exhumed),
- 1x another turtle laying directly on top of the observed egg chamber (nest not exhumed),
- 1x no signs of hatching and inability to locate egg chamber during exhumation,
- 2x tidal inundation, heavy crab predation (within 8 days of inundation) and no signs of hatching. Crab predation was confirmed during exhumation.

[1] Observers refer to two volunteers dedicated to the predation project who were trained in standard NTP methodologies.

Biopsy samples were taken from deceased hatchlings in 12 of the camera nests and 9 of the additionally exhumed nests. A summary of incubation period, exhumation results and biopsies can be found in Appendices 4, 6 and 7.

### 3.3 Photograph and data analysis

In total 29 nests were successfully exhumed (17 camera nests and 12 additional nests). One nest was found with total depredation, which was attributed to ghost crabs. A further 11 nests contained one or more suspected depredated eggs (ranging from 1 – 70 eggs), resulting in 38% of nests showing signs of depredation. The majority of these nests contained only one depredated egg (Figure 3).

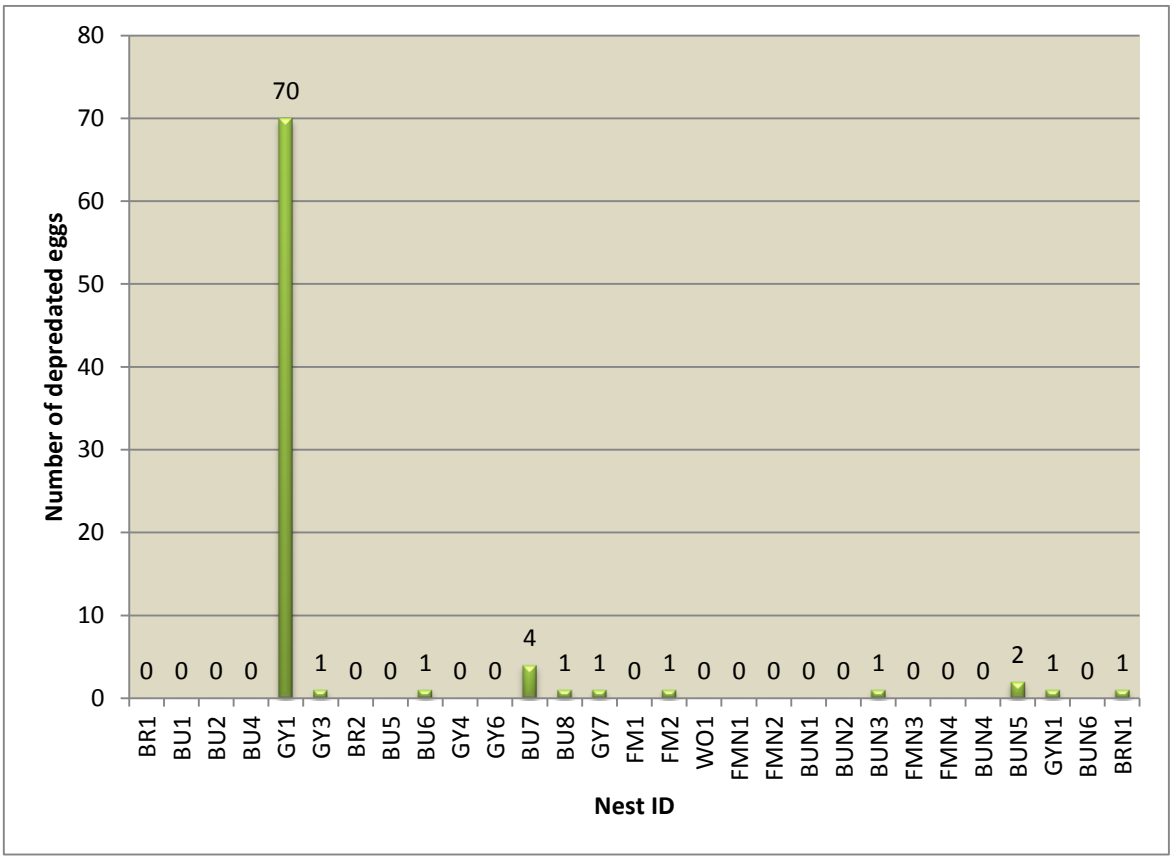


Figure 3: Number of depredated eggs recorded for each exhumed nest

Hatching and emergence success rates both ranged from 0 – 100%. In general, most nests had relatively high levels of average hatching (81%) and emergence (77%) success, with only a few nests with very low successes (Figure 4). Ten nests were found with live (presumably unviable/dying) hatchlings below the surface of the sand at least ten days after the main hatching event. The average depth of the top of the egg chamber below the surface sand was 59.4cm and the average depth of the egg chamber (span of top to bottom measurements) was 21.5cm long. Results for individual nests are provided in Appendices 4 and 6.

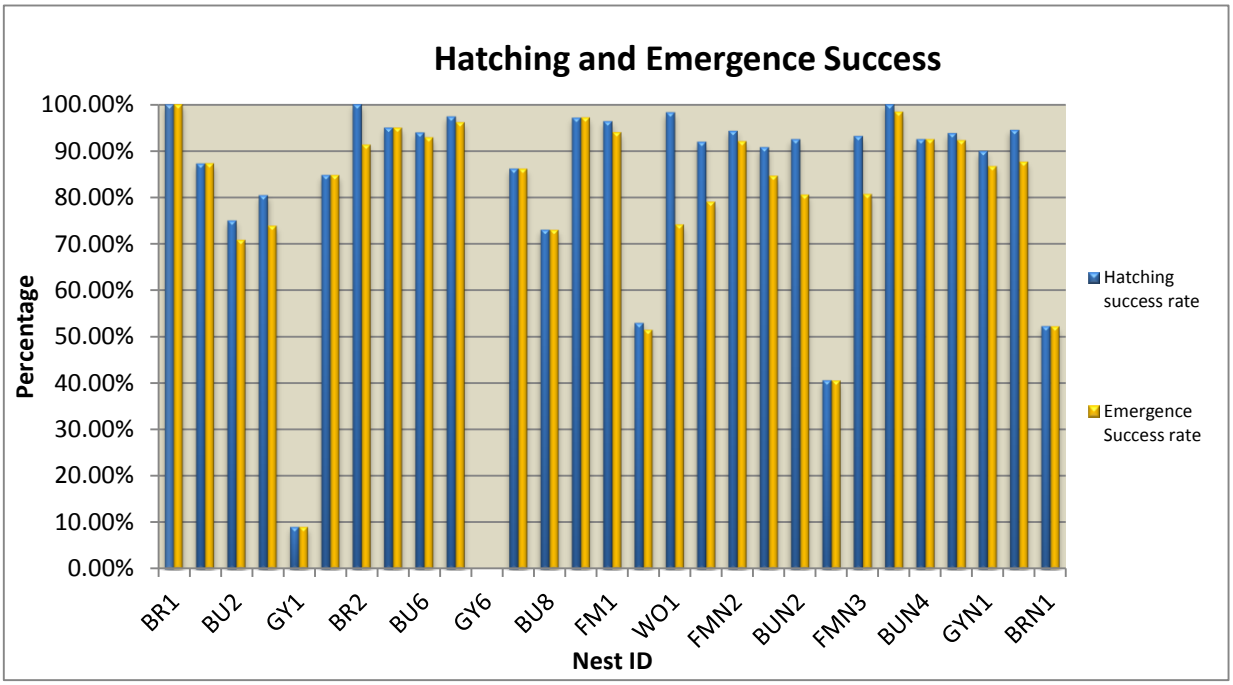


Figure 4: Hatching and emergence success rates recorded for each exhumed nest

One incidence of a dig/attempted predation was observed on the remote cameras (Figure 5), however it could not be attributed to a cause because no animal was observed in the images; no eggs were observed above the surface. One incidence of suspected fox predation on a hatchling was also observed (Figure 6), with images showing a dig and the fox seeming to consume something; however this could not be confirmed due to poor angle of the photo. No eggs were seen to be dug up during the study. Several instances of animals appearing either aware or startled by the camera were observed (Figure 7). There were also many images capturing seagull activity and predation events both during the day and at night (Figure 8).

Results for each predator species are as follows:

- cat = 0% predation, 82 instances on camera, ignored nests 98.8% of the time, was startled/aware of the camera 17% of the time.
- fox = one unconfirmed incidence of predation (3%), 33 incidences on camera, showed interest in the nest 66% of the time, was startled/aware of the camera 15% of the time.
- dog/dingo = 0% predation, 8 instances on camera, showed interest in nest 25% of the time, was startled/aware of the camera 12.5% of the time.
- goanna = 0% predation, 2 instances on camera, ignored nests 100% of the time, was not startled by the camera.
- seagulls = 13 incidences of hatchling predation (rates of interest in nests or awareness of camera was not recorded for this species).


5a)


5b)

Figure 5: First photo after possible attempted predation event (a) and seagulls showing interest in the dig 44 minutes later (b)

6a)

6b)

6c)

Figure 6: Fox digging into nest (a), leaving with what is assumed to be a hatchling in its mouth (b) and the same/another fox revisiting the nest and sniffing around two minutes later (c)


Figure 7: An example of a feral cat appearing to be startled by the remote camera


8a)


8b)

Figure 8: Multiple seagull predation events were captured both during the day (a) and at night (b)

# 4.0 DISCUSSION

## 4.1 Remote cameras and track monitoring

Camera security and potential human interference was a concern at the outset of the project. The level of interference experienced during the project was minimal but there will always be a risk of future theft that is unavoidable. Larger camera labels that can be attached to the star picket at the backside of the camera are recommended for future use.

Due to the high failure rate of cameras, several cameras were sent back to the supplier but some of which showed no fault during testing. Camera failure may have therefore been attributed to the extreme conditions in which they were placed – i.e. temperatures during this period reached up to 47°C.

Remote cameras can be an effective monitoring tool but limitations must be considered. For example, one potential predation event was not able to be confirmed due to both camera trigger failure and strong wind conditions, which removed any physical signs and tracks prior to field observation. A potential hatchling predation event by a fox was also unconfirmed due to limitations associated with camera angle. Remote cameras are also unable to capture ghost crab activity due to the exothermic nature of the crabs, meaning the camera sensors are unable to detect any noticeable difference in temperature between the crab and the surrounding environment.

Due to the combination of high rates of camera failure and their inability to record all activities, it is recommended that complementary in-field monitoring is continued to be included in any future studies on nest predation that are part of the Ningaloo Turtle Program. Though this too comes with limiting factors such as observer identification skills, windy conditions causing pads to be sand blown, and sand characteristics (i.e. difficult to identify tracks in soft dry sand). Regardless of these challenges, a high level of accuracy was recorded for observer track identification skills. It is recommended that for future studies, where observations are made daily, that the sand pad in front of the camera is also swept daily to avoid double-counting tracks, and that the boundaries of the track monitoring area are more specifically defined to ensure that all visible tracks within the range of the cameras are recorded.

Another potential issue was the susceptibility of some predator species to the noise and light emitted from the cameras. Several images were captured of foxes and cats seemingly startled by the camera and subsequently departing the study area. Furthermore, the presence of the cameras alone may alter predator behaviour through either attraction or deterrence from the nest site, depending on the individual animal. It is recommended that future studies include a treatment site with cameras and a control site without cameras for

which only in-field monitoring occurs to test for effects of the presence of equipment on the behaviour of predators.

### 4.2 Nest exhumation

The 'distance and magnetic angle' system used to locate the egg chambers proved accurate and simple. Having minimum marking of the nest (using just one post) was advantageous to reduce attraction and attention from the public and potentially predators. It does however rely heavily on accurate assessment of the egg chamber location during the initial stages of nest selection.

The 68.7 day average incubation period recorded during this study was longer than initially anticipated. This could be the result of the relatively cooler conditions experienced during the 2014-15 summer. Factors such as temperature, wind speed and direction may be influencing factors affecting the average incubation periods for green turtles at the North West Cape, however this is beyond the scope of this study.

Four of the sample camera nests could not be exhumed at the end of the study. This did not have a large impact on the results, as exhumation data were not the primary focus of the project. However, if busier nesting seasons are encountered in the future, obtaining a larger starting sample size (i.e. 30 nests) is recommended for monitoring. This was not possible during the 2014-15 season due to low nesting rates and time restrictions. If it is not possible to monitor a larger sample of nests for the full length of the camera and field monitoring period, then exhuming additional hatched (unmonitored) nests could be beneficial again to increase the sample size used to determine average hatching and emergence rates.

### 4.3 Photograph and data analysis

Due to the limitations associated with the project, as mentioned above, the predation rates estimated using current NTP methodologies could not be confidently assessed as being representative of overall predations rates over the entire incubation period. However, overall predation rates were considered low regarding both egg and hatchling predation, which is in line with the predation results collected by the Ningaloo Turtle Program (0% predation recorded during the 2015-16 season). No nests were observed to have eggs removed, other than the single nest that showed intra-nest predation, presumably by ghost crabs. Only one incidence was recorded of possible fox predation, during which it dug into the surface of a partially hatched nest and departed with what looked like a hatchling in its mouth. These two incidences cannot be compared to NTP predation data for two reasons: the NTP does not record ghost crab predation as it is not able to be accurately assessed from the surface; and nest predation levels are gauged on egg predation rather than hatchling predation because the morning-after methodology employed by NTP is based on using predator tracks, diggings and eggshells as cues to predation. It is recommended that

this study is repeated again to obtain more conclusive comparisons. This data can be used in conjunction with feral animal management and 1080 baiting plans for the area.

The average hatching and emergence success rates were reasonably high. Note however that the camera nests that were not exhumed were not included in these calculations. The main factors seeming to impinge on emergence success was ghost crab predation and occurrences of unviable hatchlings. The cause of hatchling unviability was not investigated as this was not one of the primary aims of the project. Live hatchlings were observed until they reached the water's edge but survival was not looking promising. It is assumed that these hatchlings would have been deceased inside the nest if the nest had been exhumed any later. Further studies could compare future hatching and emergence success rates alongside temperature data between the seasons.

An interesting finding was the high prevalence of seagull activity at night. The gulls were observed to be hanging around nests during the hatching period. Although seagull predation of hatchlings is not recorded in the Ningaloo Turtle Program, it is known that they are a significant natural predator of hatchlings. No management is undertaken as seagulls are a native species. It was previously assumed that the main seagull predation events occurred during the hours of dusk and dawn, however the camera images suggested night time activity is common. It would be interesting to conduct further studies on seagull predation behaviour.

Repetition of this project in the future will aid in providing more data in relation to the unknown factors raised above. It will also assist in concluding whether current NTP methodology provides an acceptable level of accuracy in turtle nest predation levels.

# APPENDIX 1: Camera Installation Datasheet

camera installation data sheet

| Date | suspected nest no./camera # | SD card | beach/section | GPS location of chamber | Turtle Species | Installed by: | *ETDoH | Actual date of hatching | *new sd card | new SD card | new sd card |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 22/11/2014 | BR1/feral38 | NC68 | Brooks-Graveyards | 21.84977 114.02703 | Green | Colin Valentine | 22/01/2015 | 2/02/2015 | 17/12/14 = EX49 | 29/12/14 = Ex26 | 10/01/15 = NC16 |
| 22/11/2014 | BU1/feral29 | NC18 | Burrows-Jurabi Pt | 21.86787 114.00762 | Green | Colin Valentine | 22/01/2015 | 30/01/2015 | 21/12/14 = EX24 | 29/12/14 = EX4 | 10/01/15 = NC14 |
| 23/11/2014 | BU2/feral 43 | NC16 | Burrows-Jurabi Pt | 21.86704 114.00899 | Green | Colin Valentine | 23/01/2015 | ?10/02/15 | 21/12/14 = No change | 29/12/14 = EX30 | 10/01/15 = NC19 |
| 24/11/2014 | BU3/feral35 | NC37 | Burrows-Jurabi Pt | 21.86856 114.00649 | Green | Colin Valentine | 24/01/2015 | None noted. | 21/12/14 = EX40 | 29/12/14 = DEC | 10/01/15 = NC61 |
| 24/11/2014 | BU4/feral26 | NC62 | Burrows-Jurabi Pt | 21.87019 114.00378 | Green | Colin Valentine | 24/01/2015 | 23/01/2015 | 21/12/14 = EX43 | 29/12/14 = EX7 | 10/01/15 = NC40 |
| 24/11/2014 | GY1/feral16 | NC35 | Graveyards-Burrows | 21.86334 114.01369 | Green | Colin Valentine | 24/01/2015 | ?04/02/15 | 16/12/14 = EX34 | 29/12/14 = EX1 | 10/01/15 = NC29 |
| 25/11/2014 | GY2/feral21 | NC63 | Graveyards-Burrows | 21.86115 114.01695 | Green | Colin Valentine | 25/01/2015 | None noted. | 16/12/14 = No change | 29/12/14 = EX21 | 10/01/15 = NC18 |
| 25/11/2014 | GY3/feral27 | NC39 | Graveyards-Burrows | 21.86431 114.01234 | Green | Colin Valentine | 25/01/2015 | ?05/02/15 | 16/12/14 = No change | 29/12/14 = EX8 | 10/01/15 = EX49 |
| 25/11/2014 | BR2/feral 30 | NC 12 | Brooks-Graveyards | 21.84992 114.02693 | Green | Colin Valentine | 25/01/2015 | ?25/01/15. Confirmed: 28/01/15. | 17/12/14 = F05 | 29/12/14 = EX17 | 10/01/15 = F05 |
| 26/11/2014 | BU5/feral 07 | NC36 | Burrows-Jurabi Pt | 21.86704 114.00893 | Green | Colin Valentine | 26/01/2015 | ?06/02/15 | 21/12/14 = No change | 29/12/14 = EX20 | 10/01/15 = NC15 |
| 27/11/2014 | BU6/feral 03 | NC19 | Burrows-Jurabi Pt | 21.86797 114 00754 | Green | Colin Valentine | 27/01/2015 | 4/02/2015 | 21/12/14 = EX28 | 29/12/14 = New camera | N/A |
| 27/11/2014 | GY4/feral I05 | NC 40 | Graveyards-Burrows | 21.86335 114.01366 | Green | Colin Valentine | 27/01/2015 | ?30/01/15. Confirmed: 02/02/15. | 16/12/14 = EX39 | 29/12/14 = EX9 | 10/01/15 = NC70 |
| 27/11/2014 | GY5/feral 08 | NC 61 | Graveyards-Burrows | 21.86394 114.01286 | Green | Colin Valentine | 27/01/2015 | None noted. | 16/12/14 = No change | 29/12/14 = New camera | N/A |
| 28/11/2014 | GY6/feral 31 | NC 33 | Graveyards-Burrows | 21.86248 114.01508 | Green | Colin Valentine | 28/01/2015 | None noted. | 16/12/14 = EX47 | 29/12/14 = EX18 | 10/01/15 = NC39 |
| 28/11/2014 | BU7/feral 41 | NC 32 | Burrows-Jurabi Pt | 21.87198 114 00130 | Green | Colin Valentine | 28/01/2015 | 8/02/2015 | 21/12/14 = New camera | N/A | N/A |
| 28/11/2014 | BU8/feral15 | NC 29 | Burrows-Jurabi Pt | 21.87186 114.00127 | Green | Colin Valentine | 28/01/2015 | ?25/01/15 | 21/12/14 = EX46 (?76) | 29/12/14 = EX33 | 10/01/15 = EX24 |
| 29/11/2014 | GY7/feral 25 | NC 20 | Graveyards-Burrows | 21.86016 114.01815 | Green | Colin Valentine | 29/01/2015 | None noted. | 16/12/14 =Ex48 | 29/12/14 = EX5 | 10/01/15 = NC37 |
| 29/11/2014 | FM1/feral 33 | NC 14 | Five mile - five mile north | 21.83582 114.05345 | Green | Colin Valentine | 29/01/2015 | 9/02/2015 | 19/12/14 = New camera | N/A | N/A |
| 30/11/2014 | FM2/feral 40 | NC 70 | Five mile - five mile north | 21.83613 114.05320 | Green | Colin Valentine | 30/01/2015 | 3/02/2015 | 19/12/14 = F04 | 29/12/15 = EX15 | 10/01/15 = NC35 |
| 1/12/2014 | WO1/feral22 | NC 65 | Jacobz - Wobiri | 21.82144 114.07660 | Green | Colin Valentine | 1/02/2015 | 14/02/2015 | 19/12/14 = EX38 | 29/12/14 = EX47 | 10/01/15 = EX38 |
| **Replacement Cameras** | | | | | | | | | | | |
| 19/12/2014 | FM1R/feral 39 | NC15 | Five mile - five mile north | 21.83582 114.05345 | Green | Colin Valentine | 29/01/2015 | | N/A | 29/12/14 = DEC (down arrow | 10/01/15 = EX39 |
| 21/12/2014 | BU7R/feral 37 | NC 67 | Burrows-Jurabi Pt | 21.87198 114 00130 | Green | Colin Valentine | 28/01/2015 | | N/A | 29/12/14 = EX23 | 10/01/15 = EX40 |
| 29/12/2014 | BU6R/feral 24 | NC30 | Burrows-Jurabi Pt | 21.86797 114 00754 | Green | Colin Valentine | 27/01/2015 | | N/A | N/A | 10/01/15 = EX34 |
| 29/12/2014 | GY5R/feral 17 | NC 17 | Graveyards-Burrows | 21.86394 114.01286 | Green | Colin Valentine | 27/01/2015 | | N/A | N/A | 10/01/15 = NC67 |
| **Additional Cameras** | | | | | | | | | | | |
| 13/01/2015 | GY5-2/feral 06 | NC 11 | Graveyards-Burrows | 21.86394 114.01286 | Green | Colin Valentine | 27/01/2015 | | N/A | N/A | N/A |
| 13/01/2015 | GY3-2/feral 32 | NC 28 | Graveyards-Burrows | 21.86431 114.01234 | Green | Colin Valentine | 25/01/2015 | | N/A | N/A | N/A |
| 13/01/2015 | BU6-2/feral 28 | NC 31 | Burrows-Jurabi Pt | 21.86797 114 00754 | Green | Colin Valentine | 27/01/2015 | | N/A | N/A | N/A |
| 13/01/2015 | BR1-2/feral 34 | NC 66 | Brookes-Graveyards | 21.84977 114.02703 | Green | Colin Valentine | 22/01/2015 | | N/A | N/A | N/A |

*ETDoH

*new SD card info form camera nest checks sheets

| new sd card | sd card removal | position of chamber from cam.(magnetic north) | nest status/hatched or other |
|---|---|---|---|
| Nest exhumed and camera removed 12/02/15 | N/A | 3m NW of camera @ 135° | |
| Nest exhumed and camera removed 12/02/15 | N/A | 3m NW of camera @ 135° | Hatched 30/01/15 |
| 12/02/15 = NC11 | Nest exhumed and camera removed 13/02/15 | 3m NW of camera @ 135° | tidal inund. ?hatch 10/02/15 |
| 12/02/15 = NC35 | Nest exhumed and camera removed 13/02/15 | 3m NW of camera @ 135° | |
| Nest exhumed and camera removed 04/02/15 | N/A | 2-5m NW of camera@ 135° | hatched 60 days |
| 12/02/15 = NC67 | Nest exhumed and camera removed 16/02/15 | 3m NW of camera @ 135° | pos hatch 04/02/15 |
| Camera nearly buried again so removed 03/02/15 | N/A | 3m NNE of camera @ 200° | inun. by sand on 20/12/2014 |
| 12/02/15 = NC63 | Nest exhumed and camera removed 17/02/15 | 3m NW of camera @ 135° | tidal inund.?hatch 05/02/15 |
| Nest exhumed and camera removed 08/02/15 | N/A | 3m NW of camera @ 135° | pos hatch 25/01/15. Confirmed: 28/01/15 |
| 12/02/15 = NC18 | Nest exhumed and camera removed 13/02/15 | 3m N of camera @180°. next to BU2 | ?hatch 06/02/15 |
| N/A | N/A | 3m NW of camera @ 135° | Hatch 04/02/15 |
| Nest exhumed and camera removed 12/02/15 | N/A | 3m NW of camera @ 135°, close to GY1 | pos hatch 30/01/15. Confirmed: 02/02/15 |
| N/A | N/A | 3m NW of camera @ 135° | 24/1/15 new nest on chamber, GY5 pos. disturbed |
| 12/02/15 = NC40 | Nest exhumed and camera removed 17/02/15 | 3m W of camera @ 90° | tidal inund. |
| N/A | N/A | 3m NW of camera @ 135° | 22/01/2015 |
| 12/02/15 = EX39 | Nest exhumed and camera removed 13/02/15 | 3m NNW of camera @105° | pos. hatch 62 days |
| 12/02/15 = NC61 | Nest exhumed and camera removed 17/02/15 | 3m SSW of camera @ 60° | tidal inund. |
| N/A | N/A | 3m NW of camera @ 145° | Hatch 09/02/15 |
| 12/02/15 = NC16 | Nest exhumed and camera removed 16/02/15 | 3m NW of camera @ 135° | pos. tidal inund. Hatch 03/02/15 |
| 12/02/15 = EX49 | 18/02/15 = EX49 removed and NC63 inserted. Camera due for exhumation on 242/02/15. | 3m NW of camera @135° | Hatch 14/02/15 |
| | | | |
| 12/02/15 = NC31 | Nest exhumed and camera removed 18/02/15 | 3m NW of camera @ 145° | |
| 12/02/15 = NC29 | Nest exhumed and camera removed 18/02/15 | 3m NW of camera @ 135° | |
| NC17 | Nest exhumed and camera removed 16/02/15 | 3m NW of camera @ 135° | |
| 12/02/15 = NC37 | Nest not to be exhumed; new chamber on top of old chamber. Camera removed 16/02/15 | 3m NW of camera @ 135° | |
| | | | |
| 12/02/15 = NC19 | Nest not to be exhumed; new chamber on top of old chamber. Camera removed 16/02/15 | 3m NW of camera @ 135° | |
| EX8 | Nest exhumed and camera removed 17/02/15 | 3m NW of camera @ 135° | |
| 12/02/15 = NC14 | Nest exhumed and camera removed 16/02/15 | 3m NW of camera @ 135° | |
| Nest exhumed and camera removed 12/02/15 | N/A | 3m NW of camera @ 135° | |
| | | | |
| | | | |
| | | | give 10 days after ETDOH to ensure all eggs have hatched. |
| | | | |
| | | | |
| | | | |

## APPENDIX 2: Daily Nest Monitoring Datasheet

| | |
|---|---|
| Estimated date of hatching | |
| section | |
| Nest/Camera # | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| date | | | | | | | | | | | | |
| predation? Y/N | | | | | | | | | | | | |
| *comments | | | | | | | | | | | | |
| photos | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| date | | | | | | | | | | | | |
| predation? Y/N | | | | | | | | | | | | |
| *comments | | | | | | | | | | | | |
| photos | | | | | | | | | | | | |

Note: Camera check required every 2 weeks.

## APPENDIX 3: Camera Integrity Datasheet

| | 13-Jan | | 14-Jan | | 15-Jan | | 16-Jan | | 17-Jan | | 18-Jan | | 19-Jan | | 20-Jan | | 21-Jan | | 22-Jan | | 23-Jan | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Camera # | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs |
| WO 1 | - | - | - | - | - | - | - | - | - | - | - | - | NC | - | NC | - | NC | - | - | - | NC | - |
| FM 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FM 1 | - | - | - | - | - | - | - | - | - | - | P | N | - | - | - | - | P | Y | - | - | - | - |
| BR 12 | - | - | F | Y | F | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BR1 | - | - | F | Y | F | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BR 2 | - | - | F | Y | F | Y | F | Y | - | - | - | - | - | - | F | C | - | F | - | - | - | - |
| GY 7 | - | - | F | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | F |
| GY 2 | - | - | F | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GY 6 | - | - | - | - | - | - | F | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GY 1 | - | - | - | - | F | C | F | C | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GY 4 | - | - | - | - | F | C | F | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| GY 5 | C | N | - | - | F | C | F? | C | - | C | - | C | - | C | - | - | - | - | - | - | F | N |
| GY 52 | C | N | - | - | F | C | F? | C | - | C | - | C | - | C | - | - | - | - | - | - | F | N |
| GY 32 | - | - | - | - | F | C | F? | C | - | - | - | C | - | - | - | - | - | - | - | - | - | - |
| GY 3 | - | - | - | - | F | N | F? | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BU 5 | - | - | - | - | - | - | - | - | D | Y | - | - | - | - | - | - | - | - | - | - | - | - |
| BU 2 | - | - | - | - | - | - | - | - | D | Y | - | - | - | - | - | - | - | - | - | - | F | N |
| BU 1 | F | C | F | N | - | - | - | C | - | - | - | - | - | - | F | N | - | - | - | - | F | N |
| BU 6 | - | - | D | Y | - | - | - | C | - | - | - | - | - | - | - | - | - | - | - | - | F | Y |
| BU 62 | - | - | D | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | F | N |
| BU 3 | F | C | F | C | - | - | F | C | F | C | - | C | C | Y | F | Y | - | - | - | - | F | Y |
| BU 4 | - | - | - | - | - | - | - | - | - | - | F? | N | C | N | - | - | - | - | - | - | H | - |
| BU 7 | - | - | F | N | - | - | F | N | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BU 8 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | C | Y | - | - | C | Y | - | - |

| | 24-Jan | | 25-Jan | | 26-Jan | | 27-Jan | | 28-Jan | | 29-Jan | | 30-Jan | | 31-Jan | | 1-Feb | | 2-Feb | | Total tracks recorded. | Total images recorded. | % Reliability. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Camera # | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | field obs | camera obs | | | |
| WO 1 | NC | - | - | - | NC | - | NC | - | - | - | NC | - | - | - | – | – | – | – | – | – | 0 | 0 | NA |
| FM 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | – | – | P | N | – | – | 1 | 0 | 0% |
| FM 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | – | – | – | – | – | – | 2 | 1 | 50% |
| BR 12 | F | Y | - | - | - | - | F | C | - | - | - | C | F | Y | – | – | – | – | D | Y | 6 | 5 | 83% |
| BR1 | F | N | - | - | - | - | F | N | - | - | - | C | F | N | – | – | – | – | D | N | 6 | 1 | 17% |
| BR 2 | F | Y | H? | - | - | - | - | - | H | - | - | - | F | Y | – | – | – | – | – | – | 6 | 6 | 100% |
| GY 7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | – | – | F | N | – | – | 2 | 0 | 0% |
| GY 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | – | – | – | – | – | – | 1 | 0 | 0% |
| GY 6 | - | - | - | - | - | C | C? | N | - | - | - | - | - | - | – | – | – | – | – | – | 2 | 0 | 0% |
| GY 1 | - | - | - | - | C | Y | C? | Y | - | - | - | - | - | - | – | – | C? | Y | – | – | 5 | 5 | 100% |
| GY 4 | C | Y | - | - | F? | C | F? | N | - | - | - | - | H | - | – | – | C? | Y | – | – | 6 | 4 | 67% |
| GY 5 | C? | Y | - | - | C | Y | C? | Y | - | - | F? | N | - | - | – | – | C? | Y | – | – | 9 | 6 | 67% |
| GY 52 | C? | N | - | - | C | Y | C? | Y | - | - | F? | N | - | - | – | – | C? | Y | – | – | 9 | 5 | 56% |
| GY 32 | C? | N | - | - | - | C | C? | Y | - | - | - | - | - | - | – | – | – | C | – | – | 4 | 3 | 75% |
| GY 3 | C? | N | - | - | - | - | C? | N | - | - | - | - | - | - | – | – | – | – | – | – | 4 | 0 | 0% |
| BU 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | – | – | – | – | – | – | 1 | 1 | 100% |
| BU 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | – | – | – | – | – | – | 2 | 1 | 50% |
| BU 1 | - | - | - | - | - | - | C? | Y | - | C | - | - | C? | N | – | – | – | – | – | – | 6 | 2 | 33% |
| BU 6 | - | - | - | - | - | C | C? | Y | - | C | - | - | - | - | – | – | – | – | – | – | 3 | 3 | 100% |
| BU 62 | - | - | - | - | - | - | C? | N | - | - | - | - | - | - | – | – | – | – | – | – | 3 | 0 | 0% |
| BU 3 | - | - | - | - | C | Y | F? | N | - | C | - | - | - | - | – | – | – | – | – | C | 9 | 8 | 89% |
| BU 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | – | | C? | Y | C | N | 4 | 1 | 25% |
| BU 7 | - | - | - | - | - | - | C? | N | C? | N | - | - | - | - | – | – | – | – | – | – | 4 | 0 | 0% |
| BU 8 | - | - | H? | - | - | - | - | - | - | - | - | - | - | - | – | – | – | – | – | – | 2 | 2 | 100% |

Notes:

- NC=Not Checked. P=Perentie. F=Fox. C=Cat. D=Dog/Dingo. Y=Yes. N=No. H=Hatch. ? = Low confidence in track ID.
- Red text indicates camera trigger failure
- When two camera numbers share the same cell this indicates there were duplicate cameras on the same star picket.

## APPENDIX 4: Nest Exhumation Information (Non-Camera Nests)

| Random hatched nest location/ID | Date of hatching | Number Emerged | Number Shells | Number Live | Number Dead | Number Undeveloped | Number Unhatched | Number Unhatched term | Number Depredated | DNA collected? | Nest depth - top | Nest depth bottom | Hatching Success | Emergence Success | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FMN1 | 14/01/2015 | 62 | 57 | 6 | 2 | 0 | 1 | 4 | 0 | AA55057 | 65cm | 140cm | 91.94% | 79.03% | |
| FMN2 | 15/01/2015 | 88 | 83 | 0 | 2 | 5 | 0 | 0 | 0 | AA55051 | Not measure | 90cm | 94.32% | 92.05% | |
| BUN1 | 15/01/2015 | 65 | 59 | 3 | 1 | 4 | 2 | 0 | 0 | No | 85cm | 92cm | 90.77% | 84.62% | |
| BUN2 | 15/01/2015 | 67 | 62 | 2 | 6 | 5 | 0 | 0 | 0 | AA55059 | 65cm | 83cm | 92.54% | 80.60% | |
| BUN3 | 17/01/2015 | 32 | 13 | 0 | 0 | 6 | 11 | 1 | 1 | AA55050 | 27cm | ~50cm (Dug to 72cm, then 82cm; no further evidence of egg shells). | 40.63% | 40.63% | |
| FMN3 | 15/01/2015 | 88 | 82 | 10 | 1 | 5 | 0 | 1 | 0 | No | 68cm | Not measured | 93.18% | 80.68% | |
| FMN4 | 18/01/2015 | 64 | 64 | 0 | 1 | 0 | 0 | 0 | 0 | AA55048 | 68cm | 82cm | 100.00% | 98.44% | |
| BUN4 | 18/01/2015 | 80 | 74 | 0 | 0 | 4 | 0 | 2 | 0 | AA55046 | 68cm | 79cm | 92.50% | 92.50% | |
| BUN5 | 25/01/2015 | 65 | 61 | 1 | 0 | 0 | 0 | 2 | 2 | AA55047 | 55cm | 70cm | 93.85% | 92.31% | |
| GYN1 | 21/01/2015 | 60 | 54 | 0 | 2 | 3 | 0 | 2 | 1 | AA55058 | 62cm | 77cm | 90.00% | 86.67% | |
| BUN6 | 8/02/2015 | 73 | 69 | 5 | 0 | 3 | 1 | 0 | 0 | No | 55cm | 73cm | 94.52% | 87.67% | |
| BRN1 | 8/02/2015 | 43 | 23 | 0 | 0 | 18 | 1 | 1 | 1 | AA55300 | 43cm | 81cm | 52.27% | 52.27% | 18 undeveloped includes 12 close to the surface that were cooked. 1 Unhatched includes an albino |

Note: the letter N at the end of the nest ID stands for 'New' – indicating they are additional nests marked towards the end of the project for exhumation only.

**APPENDIX 5: Nest Exhumation Datasheet**

# Nest Exhumation field datasheet

**Latitude:** **Longitude:** **Date:**

**Locality:** **Nest ID:** **Time:**

| **Nest Contents** | **Nest depth** |
|---|---|
| Shells: | Top: |
| Live in nest: | Bottom: |
| Dead in nest: | |
| Undeveloped: | **DNA sample #:** |
| Dead embryo: | |
| Dead embryo (full term): | **Species:** |
| Depredated: | |
| | **Recorders** |
| Clutch size: | Measured: |
| Yolkless: | Recorded: |

**Classification**
Shells: Empty egg shells
Live in nest: Live hatchlings left in nest
Dead in nest: Dead hatchlings in nest
Undeveloped: Unhatched eggs with no obvious embryo or blood spot
Dead embryo: Unhatched eggs with obvious embryo (incl. blood spot) that isn't fully developed
Dead embryo (full term): Unhatched full term embryo in egg shell
Depredated: Almost complete shells open with egg residue inside and evidence of fungi, vegetation, holes in egg etc.

## APPENDIX 6: Nest Exhumation Information (Camera Nests)

| Camera/nest # | Prior known disturbance to nest? | Date and cause of disturbance | Number Emerged | Number Shells | Number Live | Number Dead | Number Undeveloped | Number Unhatched | Number Unhatched term | Number Depredated | DNA collected? | Nest depth - top | Nest depth bottom | Hatching Success | Emergence Success | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BR1/feral38 | Yes / No | | 85 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | No | 66cm | 100cm | 100.00% | 100.00% | |
| BU1/feral29 | Yes / No | | 63 | 55 | 0 | 0 | 6 | 0 | 2 | 0 | AA55237 (old and | 69cm | 79cm | 87.30% | 87.30% | |
| BU2/feral 43 | Yes / No | | 72 | 54 | 1 | 2 | 4 | 1 | 13 | 0 | AA55205 | 73cm | 101cm | 75.00% | 70.83% | 13 unhatched term included a set of twins |
| BU3/feral35 | Yes / No | | Nest not found. | | | | | | | | | | | | | |
| BU4/feral26 | Yes / No | | 46 | 37 | 1 | 2 | 3 | 4 | 2 | 0 | AA55044 | 50cm | 82cm | 80.43% | 73.91% | |
| GY1/feral16 | Yes / No | | 77 | 7 | 0 | 0 | 0 | 0 | 0 | 70 | No | 99cm | 106cm | 9.09% | 9.09% | |
| GY2/feral21 | Yes / No | | Dune inundated camera and chamber. Camera removed. Nest not exhumed as buried under sand dune. | | | | | | | | | | | | | |
| GY3/feral27 | Yes / No | | 46 | 39 | 0 | 0 | 2 | 1 | 3 | 1 | AA55284 | 55cm | 90cm | 84.78% | 84.78% | |
| BR2/feral 30 | Yes / No | | 46 | 46 | 3 | 1 | 0 | 0 | 0 | 0 | AA55049 | 68cm | 79cm | 100.00% | 91.30% | |
| BU5/feral 07 | Yes / No | | 60 | 57 | 0 | 0 | 1 | 0 | 2 | 0 | AA55221 | 65cm | 78cm | 95.00% | 95.00% | |
| BU6/feral 03 | Yes / No | | 99 | 93 | 0 | 1 | 4 | 1 | 0 | 1 | AA55041 | 83cm | 96cm | 93.94% | 92.93% | |
| GY4/feral l05 | Yes / No | | 78 | 76 | 0 | 1 | 0 | 0 | 2 | 0 | AA55294 | 58cm | 78cm | 97.44% | 96.15% | |
| GY5/feral 08 | Yes / No | | New turtle nested directly on top of this nest 24/01/15. Camera removed. Nest not exhumed. | | | | | | | | | | | | | |
| GY6/feral 31 | Yes / No | CRABS. Chamber located. Shattered eggshells found within and outside chamber. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | No | Not measured | 98cm | 0.00% | 0.00% | |
| BU7/feral 41 | Yes / No | | 65 | 56 | 0 | 0 | 2 | 1 | 2 | 4 | AA55229 | 67cm | 83cm | 86.15% | 86.15% | |
| BU8/feral15 | Yes / No | | 63 | 46 | 0 | 0 | 14 | 2 | 0 | 1 | No | 48cm | 69cm | 73.02% | 73.02% | |
| GY7/feral 25 | Yes / No | | 70 | 68 | 0 | 0 | 0 | 1 | 0 | 1 | AA55060 | 67cm | ? | 97.14% | 97.14% | |
| FM1/feral 33 | Yes / No | | 83 | 80 | 0 | 2 | 3 | 0 | 0 | 0 | AA55379 | 71cm | 92cm | 96.39% | 93.98% | |
| FM2/feral 40 | Yes / No | | 68 | 36 | 0 | 1 | 31 | 0 | 0 | 1 | AA55247 | 51cm | 81cm | 52.94% | 51.47% | |
| WO1/feral22 | Yes / No | | 57 | 57 | 1 | 13 | 1 | 0 | 0 | 0 | AA55052 | 68cm | 81cm | 98.28% | 74.14% | |

## APPENDIX 7: Excerpt from Photo Analysis Datasheet

| Nest ID | Date | Time (24 hr) | Photo #'s | Predator/Disturbance type | Behaviour | Comments |
|---|---|---|---|---|---|---|
| BR1 | 23/11/2014 | 4:44 | 6-9 | Cat | Ignored nest | |
| | 23/11/2014 | 21:37 | 11-15 | Cat | Ignored nest | |
| | 4/12/2014 | 2:56 | 2-5 | Cat | Ignored nest | |
| | 27/12/2014 | 12:21 | 46-50 | Cat | Ignored nest | |
| | 30/12/2014 | 4:46 | 16-20 | Cat | Ignored nest | |
| | 13/01/2015 | 21:48 | 1-5 (and same in br1 -2) | Fox | Showed interest but no damage to nest | |
| | 13/01/2015 | 22:02 | 6-10 (and 11-20 in br1-2) | Fox | Showed interest but no damage to nest | seems alerted by cameras |
| | 13/01/2015 | 22:30 | 21-30 (br1-2) | Fox | Showed interest but no damage to nest | |
| | 23/01/2015 | 22:14 | 46-50 | Fox | Showed interest but no damage to nest | |
| | 27/01/2015 | 12:48 | 11-15 | Cat | Ignored nest | |
| | 29/01/2015 | 3:15 | 11-15 | Cat | Ignored nest | |
| | 30/01/2015 | 2:51 | 21-25 | Fox | Ignored nest | seems scared by camera |
| | 30/01/2015 | 3:50 | 26-30 | Cat | Ignored nest | |
| | 2/02/2015 | 12:49 | 31-35 | Dog/dingo | Ignored nest | |
| | 5/02/2015 | 4:13 | 51 - 55 (and 81-85 on BR1 - 2) | Fox | Showed interest but no damage to nest | sniffing hatched nest but then seems scared by camera noise/chasing crab? |
| BU1 | 10/12/2014 | 21:21 | 11-12 | Fox | Ignored nest | |
| | 24/12/2014 | 21:24 | 1 | Cat | Ignored nest | |
| | 12/01/2015 | 23:36 | 6-15 | Cat | Ignored nest | seems aware of camera |
| | 15/01/2015 | 22:38 | 16-20 | Cat | Ignored nest | seems aware of camera |
| | 27/01/2015 | 4:04 | 6-10 | Cat | Ignored nest | |
| | 28/01/2015 | 0:48 | 191-195 | Cat | Ignored nest | |
| | 29/01/2015 | 7:57 | 211-215 | Bird | Successful predation of hatchlings | seagulls |
| BU2 | 16/01/2015 | 8:23 | 11-15 | Dog/dingo | Ignored nest | someone's pet dog |
| | 6/02/2015 | 14:18 | 6-15 | Bird | Successful predation of hatchlings | seagulls |
| BU3 | 30/11/2014 | 20:13 | 21-34 | Cat | Showed interest but no damage to nest | seems like cat is digging to the side of nest |
| | 11/12/2014 | 21:04 | 15-29 | Fox | Showed interest but no damage to nest | |
| | 11/01/2015 | 23:10 | 6-10 | Cat | Ignored nest | |
| | 13/01/2015 | 0:02 | 11-15 | Cat | Ignored nest | |
| | 15/01/2015 | 23:15 | 16-20 | Cat | Ignored nest | aware of camera |
| | 16/01/2015 | 21:15 | 21-25 | Cat | Ignored nest | aware of camera |
| | 17/01/2015 | 22:03 | 36-40 | Cat | Ignored nest | |
| | 20/01/2015 | 2:23 | 51-65 | Fox | Showed interest but no damage to nest | |
| | 22/01/2015 | 23:54 | 66-70 | Fox | Ignored nest | eating a rodent in pictures |
| | 25/01/2015 | 21:10 | 1-5 | Cat | Ignored nest | |
| | 28/01/2015 | 1:03 | 6-10 | Cat | Ignored nest | |
| | 1/02/2015 | 20:33 | 36-40 | Fox | Ignored nest | |
| | 7/02/2015 | 22:44 | 41-45 | Fox | Showed interest but no damage to nest | startled by camera |
| | 12/02/2015 | 22:27 | 1-5 | Cat | Ignored nest | |
| BU4 | 28/11/2014 | 22:41 | 7-15 | Cat | Ignored nest | startled by camera |
| | 1/02/2015 | 4:56 | 1-5 | Cat | Ignored nest | aware of camera |
| GY1 | 29/11/2014 | 2:02 | 1-6 | Fox | Ignored nest | |
| | 9/12/2014 | 22:02 | 21-25 (102) | Cat | Ignored nest | |
| | 24/12/2014 | 20:46 | 16-21 | Cat | Ignored nest | |
| | 31/12/2014 | 2:10 | 11-15 | Cat | Ignored nest | seems aware of camera |
| | 31/12/2014 | 2:38 | 16-20 | Cat | Ignored nest | |
| | 14/01/2015 | 23:10 | 11-15 | Cat | Ignored nest | |
| | 16/01/2015 | 2:22 | 16-20 | Cat | Ignored nest | |
| | 26/01/2015 | 2:53 | 1-5 | Cat | Ignored nest | |
| | 27/01/2015 | 1:50 | 6-10 | Cat | Ignored nest | startled by camera |
| | 1/02/2015 | 3:21 | 66-70 | Cat | Ignored nest | |
| | 14/02/2015 | 22:16 | 1-5 | Cat | Ignored nest | |
| | 15/02/2015 | 2:26 | 6-10 | Cat | Ignored nest | |
| GY2 | 27/11/2014 | 2:15 | 21-25 | Fox | Showed interest but no damage to nest | sniffed around 3 hrs after a turtle visited |