University of Glasgow Exploration Society

Cyprus Turtlewatch 2011

Expedition Report

 

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Contents

Foreword page 2

Acknowledgements page 3

Introduction page 4

Methodology page 5

Evaluation of 2011 page 6

- Annual Data
- Temperature Data Logger Results
- Dissertation Work Carried Out

Recommendations for 2012 page 13

- Project Recommendations

Logistical Overview and Accounts- Appendices page 16

- -Appendix 1: Location
- -Appendix 2: Personnel
- -Appendix 3: Finances

References page 21

Foreword

Throughout the summer of 2011 from June until September, Glasgow University student volunteers participated in active conservation and research work on the loggerhead and green turtle populations nesting on the Akrotiri peninsula of Cyprus. This was the 15th year that the Turtlewatch expedition was organised through the Glasgow University Exploration Society in conjunction with RAF Akrotiri. Without this support network the work could not have been accomplished. The expedition gained valuable knowledge and long term data, with 42 nests laid in the 2011 season, following on the success of the 2010 season which had 52 nests. It was possible to carry out research into nest incubation temperatures, which was supported by the MOD Cyprus Wildlife Section. It is hoped that the data collected will benefit the long term project and the survival of these species, and that the knowledge and experience gained by the expedition members was beneficial. All of the research and feedback will be used to improve further expeditions.

Faye Honeyman

Acknowledgements

Sponsorship: Firstly, we would like to extend our appreciation to all those that contributed funding to the Expedition; The Carnegie Trust, Gilchrist Educational Trust, Glasgow Natural History Society, and the University Court. For a full breakdown of finances see Appendix C.

In Glasgow: Thanks to Prof. Roger Downie, Dr. Isabel Coombs, and Dr. Stewart White and for all their help and support with the preparation of the expedition. We offer our thanks to all of the local businesses and companies that generously provided raffle prizes. Thanks also to Bar-One Ltd. for our t-shirts and hoodies. Last but certainly not least thanks to all of the families and friends that bought t-shirts, tickets, and who came along to all the fundraising events.

In Cyprus: Special thanks to Sgt Jason Smith, Turtlewatch Akrotiri Co-ordinator. He is an invaluable mentor who provided support and experience and without his help this project would not be such a success. Thanks also go to the deputy co-ordinators Sgt Andrew Wilson and Sgt Tom McGowen who helped out with excavations and provided support. Thanks to Flight Lieutenant Jamie Shepherd, Turtlewatch Akrotiri's RAF coordinator. Thanks also to the SBA environment department who help to take action for, and enforce, turtle-friendly measures in relation to our research. Also thanks to Station Commander Group Captain D B Thomson for allowing Turtlewatch to work and stay on RAF Akrotiri and for providing food, accommodation and transportation.

Introduction

In the Mediterranean there are two species of sea turtle that nest along the coasts of Greece, Libya, Israel, Turkey and Cyprus. Both green turtles (*Chelonia mydas*) and loggerhead turtles (*Caretta caretta*) are classified as endangered in the world by the IUCN (International Union for Conservation of Nature). IUCN also states that green turtles are in a major worldwide population decline. In order to lay, female adult turtles return to the beaches they were born on (natal) beaches, although no one is sure how or why they do this [1,2].

These (and other) marine species are becoming increasingly pressurised by human influence upon the world's resources. Fishing and pollution are destroying their marine habitat whilst sound and glare from lights has the effect of either disturbing adults trying to nest, or confusing hatchlings attempting to get to the sea[4]. In Cyprus, hatchlings are also at risk from predation both during development and after hatching. Whilst travelling from nest to sea they can face predation from foxes, seagulls, ghost crabs and other predators, and as a result many lose their lives on this perilous journey.

Another emerging threat to turtles is global warming. Rising temperatures not only mean changes to their food supply and habitat, but also affect hatchling development. Turtles rely on environmental sex determination, thus the temperature of the nest affects the ratio of males and females in the nest (above 29^{o}C results in predominantly females, below results in males) [5]. If temperatures continue to rise, then a severe female biased sex ratio will result and female turtles will find it increasingly difficult to locate males for mating[5].

In Cyprus, *C. caretta* lay throughout the summer (from end of May till the beginning of September), whereas *C. mydas* have a shorter season and lay from just the end of June till August. Weather patterns and the trophic status of the individual cause differences in laying times. The two species have slightly different laying and development strategies; *C. mydas* can take as many as 4 hours to lay a nest of as many as 250 eggs, whilst on the other hand *C. caretta* may take just an hour to dig and lay a nest which is reflected in the number of eggs they lay (around 50-150). Incubation times vary from 44-60 days (with *C. mydas* having slightly shorter average durations than *C. caretta*) and hatch from the end of July till the end of September (Turtlewatch data unpublished).

The sea turtle conservation programme RAF Akrotiri Turtlewatch has been running since 1991 and Glasgow University has been involved since 1997. The main turtle nesting beaches are situated a few kilometres to the west of the base, behind Akrotiri village, and are located within the Sovereign Base Area (land which is occupied and run by the British military in Cyprus).

The main aim of the project was to monitor and conserve the local turtle populations. The expedition also had two other aims:

- To educate the local community on the plight of turtles
- To give students the opportunity to carry out valuable conservation work.

Details of how these were carried out are provided in the methodology.

The expedition was run by two student leaders (Faye Honeyman and Kirsten Fairweather) who were both highly experienced in the project, and so could inform other students on the correct procedures for monitoring and hatchling handling. Before the students arrived, a beach clean-up was organised involving the local community so that the beaches were clean (and so safe) for turtles to lay on. These beaches were monitored throughout the season to ensure that this standard was maintained throughout.

Methodology

As the nesting and hatching season takes place over roughly 4 months, three groups of students were rotated over this period, thus allowing the greatest number of students to participate. These students were in Cyprus for roughly five weeks each while the leaders stayed for the duration of the season to allow consistent working practices.

As the majority of turtle activity occurs at night, students were present at the beaches from 9pm-6am. Patrols along the lengths of all the beaches were carried out every 2 hours. During patrols at the beginning of the season students searched for evidence of turtle activity, which consisted of tracks left by a turtle that had previously laid or a turtle that was currently laying. Where a turtle was found in the process of laying a nest, a temperature data logger (TDL) was dropped into the nest with the eggs before the female began to cover it up. The TDL was dropped into the nest while the turtle was in her laying 'trance' and so the procedure was able to be carried out with the least possible disturbance. False crawls, where no nest has been laid, were also recorded. When a nest was found, the nest chamber was located and a protective cage (which allowed enough space for the hatchlings to escape) was placed on top to aid in the prevention of predation from foxes. A sign displaying a nest number and advice in both English and Greek was placed next to the nest to warn beach users not to disturb the nest area. During all patrols, students used red light filters on their torches so as not to disturb the turtles. From the date that the nest was laid, combined with previous years of data, the expedition leaders could estimate when the nest was due to hatch.

Later in the season, when the nests were beginning to hatch, patrols changed to every hour in frequency and students searched for evidence of hatchling emergence. If hatchlings were found, the students helped to guide them to the sea so that other lights did not disorientate them. This was also done to ensure minimum beach predation. Once evidence of hatching was found, the nest was excavated 10 days after first emergence for nests of both turtle species to comply with local legislation. Two nest excavations a season were made public for educational purposes.

During excavations, the nest chamber was dug out by hand and any stranded hatchlings found were released. These were carried out at early evening so that the hatchlings could avoid fish feeding at dusk and scorching mid-day sun and sand temperatures. The number of infertile, early and late stage development, hatched and dead hatchlings were all recorded to add to the existing long-term data set.

Evaluation of Turtlewatch 2011

The 2011 season followed on from the 2010 season, with 42 nests laid in total throughout the season. The nests were dispersed on 3 of the coves that Turtlewatch patrols, with none on coves 2, 5 and 6 and the beaches on base. This total figure included 10 nests from green turtles. This is excellent news for the project, as prior to 2010 no more than 7 green nests had been recorded. It is possible that due to increased levels of human disturbances on Episkopi beaches, green turtles are moving slightly further around the coast to Akrotiri where the level of human disturbance is much lower. We hope to see this increased level of activity from green turtles into the 2012 season.

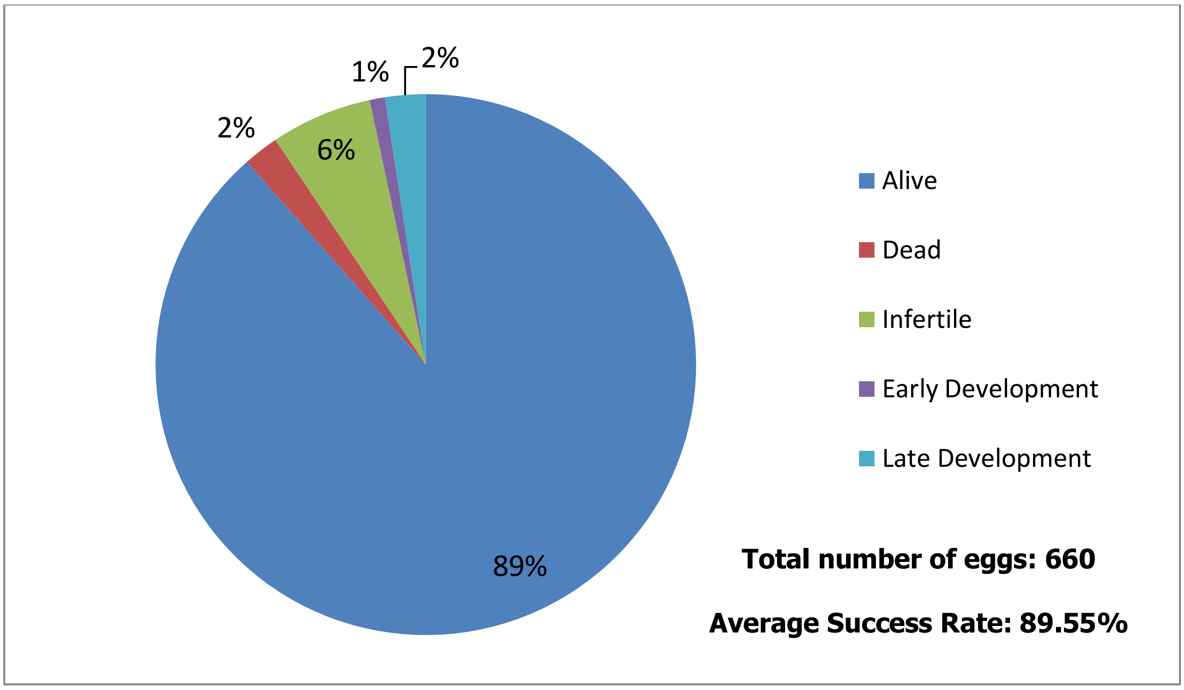


Figure 1: Green nesting data, total egg count and average nest success rate for 2011

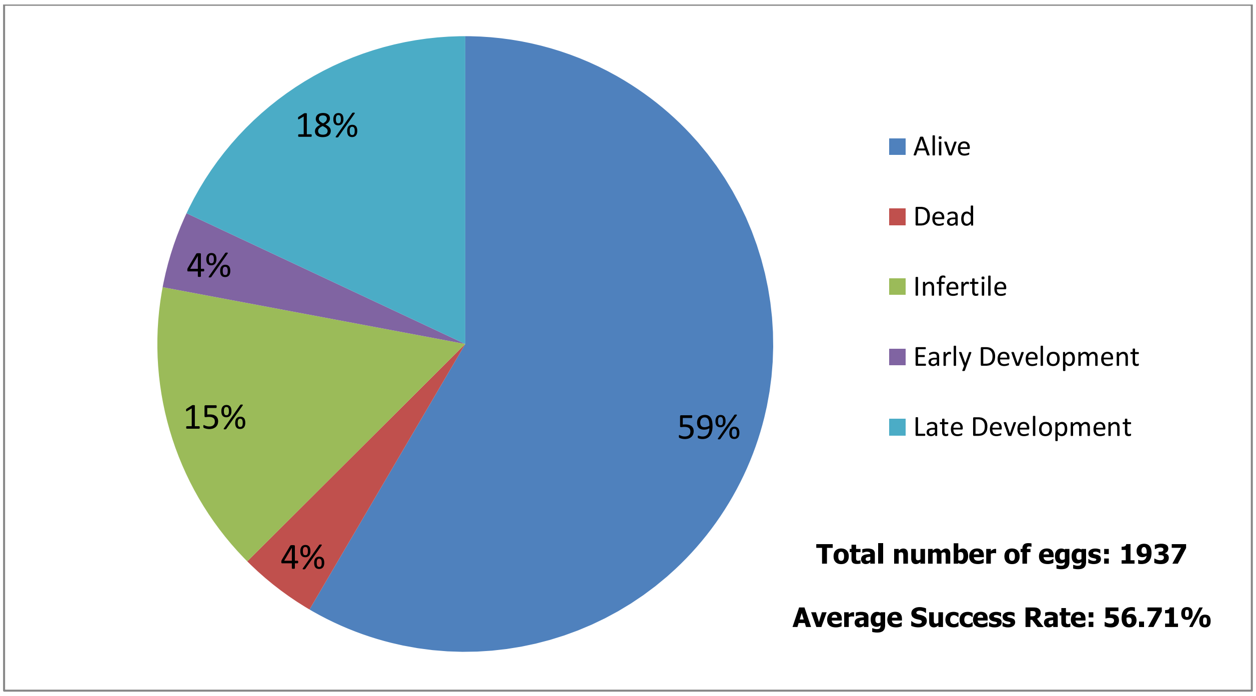


Figure 2: Loggerhead nesting data for 2011

As shown in Figures 1 and 2, green and loggerhead nests had different hatchling success rates, with green nests on average being more successful (average of 89.55% as opposed to 56.71% in loggerhead nests). This shows an improved success rate for green nests in 2011, compared to 2010, by almost 30% (see Fig. 3), therefore bringing the total back in line with average green success levels since 1999. On the other hand a slight decline in the hatchling success rate of loggerhead turtles can be seen in 2011 compared to the 2010 season. This occurred despite a huge reduction in nest predation during the 2011 season, and may possibly be explained by increased water damage to many loggerhead nests on two separate occasions, despite the continuation of preventative measures i.e. sandbagging any nests near to the high tide mark, and relocating any nests below the high tide mark.

Year	Number of Nests		Mean Hatchling Success Rate (%)		Mean Incubation Period (Days)		Mean Clutch Size	
	Green	Logger	Green	Logger	Green	Logger	Green	Logger
2011	10	32	89.55	56.71	50	52	92	71
2010	12	40	60	59	54	51	111	81
2009	5	49	74	49	51	51	89	54
2008	7	23	85	56	44	44	106	73
2007	0	33	-	69	-	53	-	69
2006	3	24	83	69	53	55	95	75
2005	0	10	-	40	-	56	-	82
2004	2	18	92	64	54	51	122	94
2003	1	4	76	19	48	58	97	65
2002	0	23	-	64	-	53	-	79
2001	3	22	82	62	51	49	123	87
2000	6	9	94	84	52	52	100	81

The table above (Figure 3) shows the overall increase in nest numbers from 2000 to 2011. It also shows the fluctuations in mean hatchling success rate and the mean incubation period in both loggerhead and green nests. The 2011 season had the highest success rate for green hatchlings that has been recorded since 2004, though this could just be due to the increased number of nests, and not an environmental factor. Loggerhead success rates for 2011 appear to be fairly true to the general trend seen since 2000, with the slight decrease being attributed to the number of loggerhead nests damaged by elevated tide levels. Mean clutch size had decreased for both species compared to 2010s figures, but did not deviate far enough from the mean over the past 10 years to cause concern. The 2011 clutch size figures also support last year's findings that low clutch sizes for 2009 appear to be an anomaly rather than the start of a rapid declining trend.

Temperature Data Logger Results

Where a TDL was dropped into a nest, the aim was to place the TDL as close to the middle of the clutch as possible in order to record the intra-nest temperatures and to create a nest temperature profile for each nest. In total, temperature profiles were extracted successfully from 6 nests. Of those 2 TDLs were placed in green nests and 4 TDLs were placed into loggerhead nests. Several other TDLs were placed into nests but profiles were unable to be created owing to water damage to the devices.

This project observed a range of nest temperatures from 26.5-34°C. These results recorded are in accordance with the results gained from northern Cyprus where the mean nest temperatures range from 29.5°C to 33.2°C[5]. The critical pivot of 29°C was surpassed in the middle of the incubation period by three of the six nests which had temperature profiles. In these three nests it is likely that all of the hatchlings that survived were female[5]. The final three nests were also recorded to be close to the pivotal temperature during the second third of incubation when sex is determined.

There are several factors which can affect individual nest temperatures which include; beach albedo, levels of solar radiation, periodic water inundations, dimensions of a nest cavity, sand particle size, and atmospheric temperatures[1&5]. Nest depth can be crucial in buffering the effects of these factors so therefore, for the 2012 season, it is recommended that these factors be explored and the nest depth to be recorded. If these two features are analysed, then some conclusions can be drawn as to which of the factors have an effect on each of the nesting beaches.

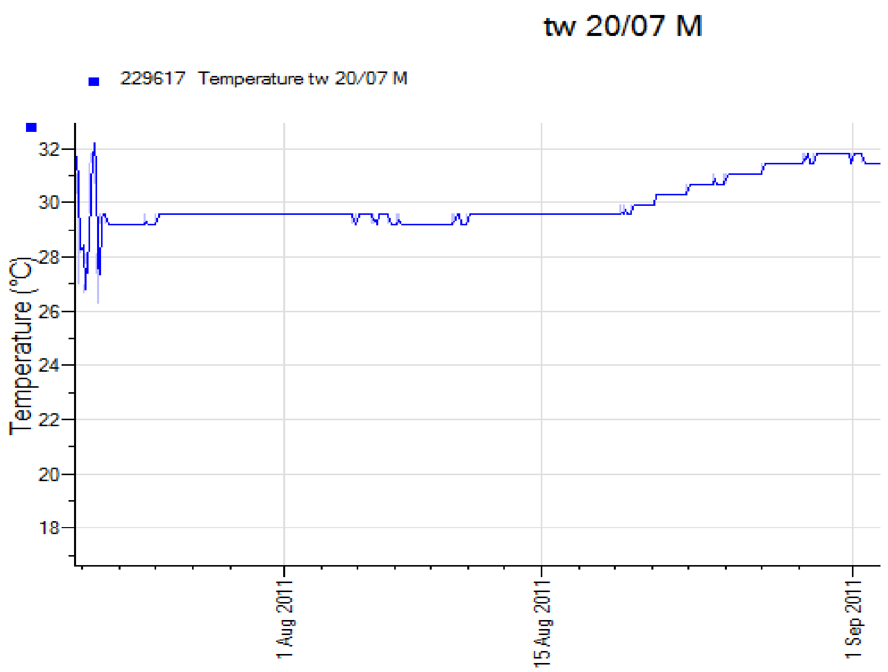


Figure 4.

Graph showing the temperature profile of a Green nest from 2012. (Fluctuations at the start correspond to the time before the TDL was placed in the nest).

Dissertation Work Carried Out In Cyprus

Introduction and Aims

During 2011 the student deputy leader Kirsten Fairweather carried out dissertation data collection on nesting turtle activity and epibionts occurring on turtles' carapace. The following aims were investigated:

1. Recording barnacle distribution patterns on both green and loggerhead species
2. Recording any differences in barnacle distribution and number between green and loggerhead species
3. Recording if a correlation between carapace size and barnacle number is present
4. If nesting activity is influenced by lunar cycle
5. If nesting activity is influenced by tidal cycle
6. If nesting activity is influenced by night phase

Methods

During fieldwork from 01 June to 21 August 2011 turtle nesting behaviour and barnacle presence was recorded on green and loggerhead turtles. False crawl u-turn – tracks leading from and back to the sea without a nesting attempt; False crawl attempt – tracks leading from and back to the sea with a nest attempt visible as a turtle size crater in the sand or visible nest chamber; Successful nest – seen as a mound of loose sand as a result of the female covering the nest chamber were recorded upon discovery during night patrols. Also recorded was time and date of observation, species of turtle and carapace length and width. Barnacle presence was noted with distribution and number of barnacles recorded if present. Successful nesting activity was available for 1999-2010. Nesting activity was correlated with lunar cycles (new moon, first quarter, full moon, and last quarter), tidal cycles (Low tide, low tide rising, mean tide rising, rising to high tide, high tide, high tide falling, mean tide falling and falling to low tide) and were grouped into night phases of one hour intervals from 2100h to 0659h. Statistical analyses (one way ANOVA, regression analyses, two –sample T test and chi^2) were used to analyse the data.

Results and Discussion

214 loggerhead and 51 green nests were recorded from 1999-2011, with 67 loggerhead and 41 green nesting activities recorded in 2011. Loggerhead nesting activity was found to be related to lunar cycle with a higher level of activity being recorded during full and new moon phase. Loggerhead successful nesting was highest during the new moon phase, with both false crawl u-turn and attempt activity highest during the full moon. P values obtained were lower for false crawl activity than successful nesting suggesting that lunar cycles are more influential in false crawl activity. During the new moon, the moon is at its darkest,

emitting no light on the beaches. During this phase it would be expected that the environment would be best for turtles to nest as objects or movements on the beach would be less easily observed. Full moon phase is when the moon is at its brightest, during which time the beaches are very well lit making objects and movements more easily visible. As false crawl activity was highest during this phase it is suggested that lighting on the beaches is the cause of a lower number of nesting.

Green turtle activity was also related to lunar cycle with successful nesting being highest during the full moon with false crawl u-turn activity being highest during the full moon and new moon. During fieldwork green turtle false crawls were observed to have several nesting attempts with many not occurring due to rock under the sand. This may explain the high instance of false crawl u-turns during the new moon.

Both loggerhead and green activity were related to night phase, with peaks in activity at a different night phase. Loggerhead activity showed a normal distribution, with activity peaking at the 0000-0059h phase as shown in figure 1. At this time the night is at its darkest, and also means that successful nesting can be completed under the cover of darkness. During dusk and dawn the beaches would be lighter deterring the female from successfully nesting.

Green activity peaked at 2300-2359h, 0000-0059h, and 0300-0359h phases as shown in figure 2. As green turtle nesting data is related to tidal phase it is speculated that the changes in tidal cycles have cause the peaks in activity and these times. During the 2300-2359h and 0000-0059h phases the beaches are at their darkest and high nesting activity was expected. At 0300-0359h it would be unexpected for there to be high activity as dawn would begin during the nesting attempt. In looking at the activity that was observed during and after 0300h one nest was recorded with the rest of the activity being false crawls as would be expected.

Loggerhead nesting activity was not related to tidal cycles with highest activity during high tide, and both mean tide falling and falling to low tide as shown in figure 3. Green turtle activity was related to tidal cycles with activity highest during high tide and high tide falling as shown in figure 4. As the green turtle is the largest of the hard shelled turtles there is high energy expenditure in moving their body mass on land. By emerging during high tide the turtle has less distance to travel before reaching a suitable nesting location and so energy resources are saved for the nesting attempt. Loggerhead turtles are smaller than green turtles and so it is possible that they do not need to emerge during high tide if there is an advantage in emerging at another time, for example during the darkest time of night.

Figure 1: Loggerhead nesting data in relation to night phase

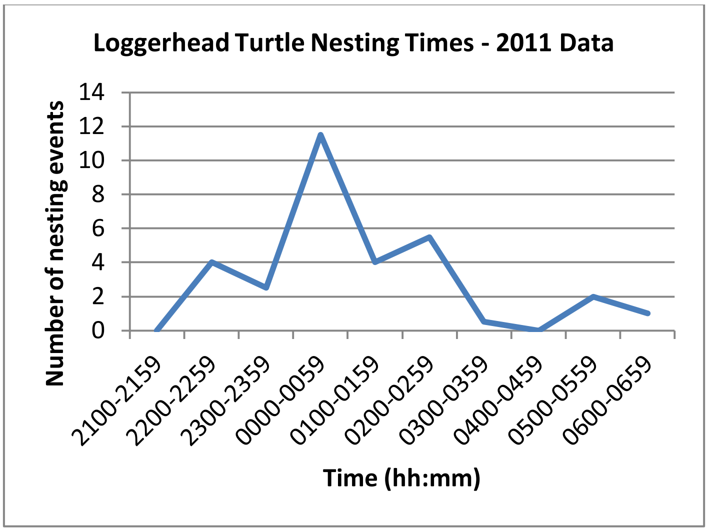


Figure 2: Green turtle nesting data in relation to night phase

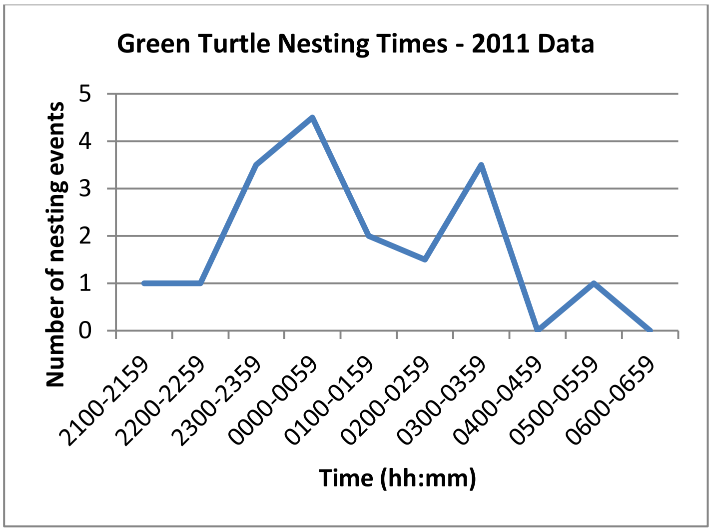


Figure 3: Loggerhead nesting activity related to tidal cycle

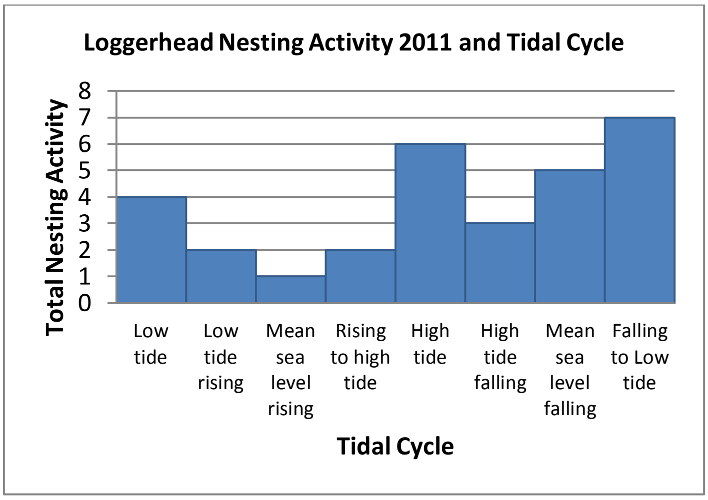
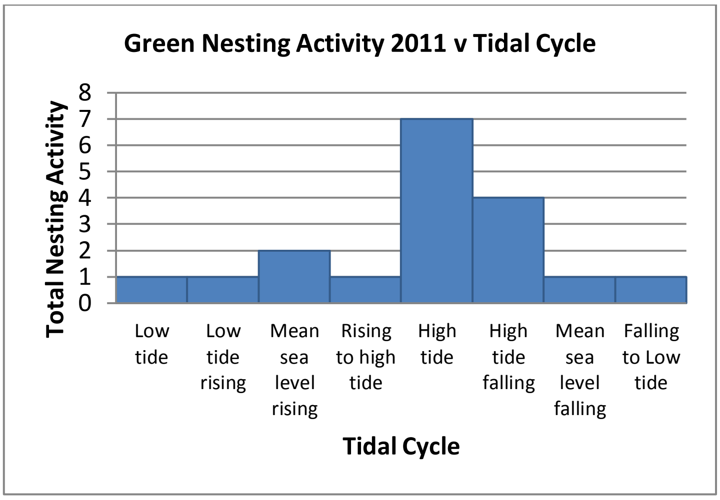


Figure 4: Green nesting activity related to tidal cycle



23 loggerhead turtles were recorded for barnacle data and distribution was significantly highest on the vertebral section. Turtles have been observed to rest their posterior flippers flat over the top of the carapace which could explain the lower numbers of barnacles on the left and right regions of the carapace[14]. During mating behaviour the male turtle clasps onto the side of the females carapace which may cause barnacles to be knocked off[10] .In analysing the hydrodynamics of the turtle carapace, differential water flow patterns are observed in each region, with flow being highest at the anterior region, moderate at the middle region and low at the posterior region[13]. As barnacles are sessile feeders they depend on water flow to provide their food source therefore explaining the preference of barnacle settlement in moderate water flow areas. Mullineaux and Butman[15] recorded factors influencing barnacle settlement and found a preference in flatter surfaces for attachment. As the flattest area of the loggerhead carapace is the second vertebral scute[11], this could perhaps explain the higher number of barnacles recorded in both the anterior and middle vertebral regions. Collectively all these factors influence barnacle settlement but to which extent each contributes is relatively unknown.

When divided into small and large size classes the smaller group had a larger number of barnacle presence. However, when looking at carapace length the barnacle load increased with increasing carapace length. As loggerhead turtles are known to have a high epibiont load, and that epibionts are not indicative of the turtles' health[16], it is perhaps the case that several other factors play more influential roles in barnacle settlement than carapace size.

13 green turtles were recorded for barnacle data. Overall distribution was lowest on the right hand side however on the posterior region no barnacles were recorded on the vertebral section. Higher numbers were also observed on the anterior of the carapace. Distribution was significantly highest on the left hand side of the carapace. As observed by Heithaus et al[12] green turtles rub their carapace on rocks or sponges, cleaning themselves of epibionts. It is possible that the anterior section is more difficult to rub against such surfaces and so a higher epibiont load has occurred in this area. During mating the male plastron rubs against the females' carapace possibly explaining the lower occurrence of barnacles on the posterior section and the fact that no barnacles were found on the posterior vertebral section.

Barnacle numbers were found to decrease with increasing carapace length for green turtles. It was also found that barnacle numbers were lower on the larger carapace size class than the smaller. As epibiont load has been found to be indicative of the turtles' health, it is speculated that in order to grow to such a large size (with the green turtle being the largest of the hard shelled turtles) they need to be of good health. In doing so, they can partake in grooming behaviour which is energetically costly, removing their carapace of epibionts[16].

Overall results found in Akrotiri show the differences in barnacle distribution between green and loggerhead turtles. The different distributions can be attributed to differing behaviours of the two species of turtle as well as the loggerhead turtle being known to harbour a high epibiotic load at apparently no cost to health. As a relatively small data set is used it is suggested that this study is reviewed with several more years of data.

Recommendations for 2012

The 2011 season saw the nightly patrols begin at 9pm instead of 10pm as in years previous to 2010. This had the effect of more turtles being recorded in addition to their tracks. The 2011 season also saw the further use of powerful red-light torches to make tracks and observation of the turtles easier with minimum disturbance. It is recommended that both of these practises continue into the 2012 season. 2011 also saw the introduction of blue-light small torches to help guide hatchlings towards the sea, which was made necessary due to increased light pollution behind the beach, and was found to be highly successful.

When a nest was predicted to hatch, Turtlewatch volunteers slept by the nest and the nest was checked at hourly intervals to try and observe hatchling emergence. We feel that this was an effective method for spotting hatchling tracks and deterring predators. It is therefore recommended that this procedure continue into the 2012 season.

In the 2011 season (as in previous seasons) nests laid below, or just above, the high tide line were relocated to try and prevent water logging and subsequent hatchling mortality. We found that the negative effects associated with this type of action (including a greater rate of infestation by fly larvae and altered nest parameters) did not occur. We also found that relocating the nest caused the obvious elevation in nesting success rate of a nest that would otherwise have been completely or only partially successful. The use of sand bags to aid protection was also more strongly reinforced, as tidal levels on the beaches were highly altered during the 2011 season due to a change of structure in a nearby harbour. Now that a new high tide level has been established it is recommended that both practises continue into the 2012 season.

A practice that we still did not feel was beneficial in any way was the continuation of the policy regarding the excavation of nests. The nest excavations of both Green and Loggerhead nests continued to be postponed from 3 days after first natural hatchling emergence to 10 days. Hatchlings absorb their yolk sacs before they emerge from their shells and use this as their food source for the first two-week period, which they spend continuously swimming to avoid predators in shallow coastal waters[8]. Leaving trapped hatchlings in the nest for 10 days meant that when we excavated some nests we found seriously emaciated and dehydrated hatchlings. This drastically affects their locomotive capabilities, in both the terrestrial and aquatic environments[8].

Skin infections and sores were also more prevalent on most of the trapped hatchlings which had remained in the nests for 10 days. Leaving egg remains in the sand also attracts bacteria and many Dipteran larvae, which further increases the mortality rate of trapped hatchlings [3, 7]. We feel that this policy is not beneficial in any conservation sense and inconsistent with the practices of previous years, and would thus recommend again that the period for nest excavations of both species be reduced for the 2012 season.

The following section outlines some recommendations that could be implemented in the 2012 season. It is hoped that further research will aid in the conservation of this species and its habitat.

Project Recommendations

1. Habitat determination studies including data on the following:

- Extensive vegetation studies
- Sand temperature profiles
- Nest temperature profiles
- GPS of nest locations
- Gradient of beaches

2. Tagging of nesting females which would allow measurements from the females (including carapace and flipper length) to be taken while a tag was attached to a hind flipper. This could also be accomplished using PIT tags. This would also allow data to be collected on beach selection by females, number of nests laid etc.

3. Facilitate the implementation of post mortems on washed up turtles for information on toxicology, cause of death, general health of the turtle, age, sex etc.

4. Observing hatchling dispersal patterns with the possibility of a 4th year dissertation.

5. Facilitate filming of the turtles with cameras and red-light/infrared lights.

6. Sex determination by dissection.

- This would involve taking late stage development embryos and placing them in a preservative. They would then be taken back to Glasgow University for dissection of their gonads.
- This would allow the determination of a sex ratio for nests/species but requires a CITES license.

7. Collect basic nest parameter measurements from the nests on the Akrotiri beaches. This is already partially accomplished by the collection of excavated eggs and the calculation of the hatching success rate. However it would also be beneficial to measure nest depth to study how it is correlated with temperature.

8. Continue to build on the relationships founded with Akrotiri Environmental Centre and local fishermen. This will also help us to involve more locals in nightly patrols. This activity is already established, but could easily be expanded to include several visits per week.

Appendices

Appendix A: Location

The beaches which were monitored are situated a few kilometres away from Akrotiri village, situated within the Western Sovereign Base Area in the south of Cyprus. This year, as in previous years, we were fortunate enough to be allowed to stay on the base at RAF Akrotiri. Accommodation was provided in temporary stay blocks within the base. These comprised of twin rooms with shared toilet and shower facilities. As the group was comprised of both males and females, separate blocks were provided which were situated around 2 minutes from each other.

Appendix B: Personnel (19 members)

Expedition leaders: Faye Honeyman and Kirsten Fairweather

Faye spent 15 weeks in Cyprus during the 2010 season as an expedition leader, and so was able to pass her knowledge onto other students taking part for the first time. She has now graduated from the University of Glasgow with a degree in zoology and hopes the skills gained from the expedition will be of invaluable use to her in the future. She highly enjoyed the experience of working with such incredible creatures and playing an active part in their conservation.

Kirsten first participated in Cyprus Turtlewatch as a team member in 2010. During 2011 she found being deputy leader a rewarding experience, particularly in being able to teach other team members skills which she had learnt during the 2010 expedition. To be able to lead the team in 2012 will not only provide another year of important conservation work but will give her many experiences in organising the expedition and in the field which will aid in her future prospects in conservation.

Both Faye and Kirsten are qualified first aiders and hold full UK driving licences.

The groups were split up in such a way to ensure an adequate number of drivers were present each month; there were at least 2 drivers in each group. The groups incorporated a variety of students from different academic years and backgrounds allowing the more advanced students to pass on their knowledge.

Group 1

Kathryn Nairn

This was Kathryn's second expedition to Cyprus with Turtlewatch, having also been a member in 2011. She highly enjoyed returning for a second time to see such amazing creatures again, as well as having the opportunity to pass on the skills and experiences she had learnt previously to newer members of the team. Kathryn will be once more returning in 2012 to help train new members.

Emma Hargreaves

Emma also took part in the 2011 Turtlewatch expedition. As a returning member she was invaluable in passing along the skills she had previously learnt to less experienced members. She has enjoyed being a part of the expedition and working to aid the conservation of marine turtles.

Kristopher Houston

Kris feels that his trip to Cyprus has given him hands on experience on what a degree in zoology could offer as a career. Fundraising, working in a team and meeting new people were all aspects of his Cypriot time that he feels developed his communication, social skill and confidence. Overall he feels it was an amazing life experience.

David Bryden

David found Turtlewatch Cyprus to be a fantastic way to learn about the ecology of sea turtles and, since he is a zoology student, found that it really assisted in his studies. He also found it was great fun and full of new experiences, part of which was thanks to the friendly reception and cooperation from the RAF personnel on base.

Hannah Lafferty

This was Hannah's first expedition with the University of Glasgow Exploration Society and she found it to be a very rewarding experience. It allowed her to gain conservation skills through active participation in a well-established expedition, as well as gain in confidence and meet new people in the process.

Group 2

Hazel Gibson

Hazel found the experience invaluable, and thinks it is an excellent opportunity for students to gain hands on experience in important conservation work. She was thrilled to return to the expedition for a second year, as it allowed her to see the adult turtles which she didn't get to do the first time and to share her previous knowledge with other members of the team.

Alistair Green

Alistair returned to Turtlewatch for his second expedition. He thinks that having this opportunity has given him vital experience that would be necessary for his future career choice, and that It has been an incredible experience that has allowed him to further his knowledge in marine conservation, learning about the lifestyle/habitat and raising his awareness of the endangered sea turtles. It has also given him a chance to learn about the different Cypriot culture and to meet new people and make new friends.

Elaine Jenkins

This was Elaine's first expedition and she was grateful to be allowed this amazing experience. She really enjoyed working with such brilliant animals and having the opportunity to gain some first-hand conservation experience, which she feels will be highly beneficial to her in the future.

Simon Grey

Simon really enjoyed being part of the Turtlewatch team. He gained a lot of valuable experience in working with marine turtles and it also provided him with plenty of information of how hands-on conservation really works. He had a lot of fun as well and would definitely recommend that others join the team in the future to help the plight of the turtles.

Roisin Lyle- Collins

Roisin feels that the expedition is highly rewarding and provides a crucial role in the conservation of marine turtles on Cyprus. She feels that the experiences she gained will be transferable to help her both with her studies and with future conservation projects she undertakes.

<u>Group 3</u>

Virginia Woollven

Virginia feels the expedition provides first-hand experience in the role of conservation of endangered species and is extremely rewarding in that respect, as well as furthering her knowledge in the zoological field. She also believes that Turtlewatch is an extremely worthwhile and valuable expedition that allows close contact with some truly beautiful endangered species, and offers a valuable opportunity to gain research skills in the field.

Fionntan McCabe

Fionntan also attended the 2010 expedition to Cyprus. He feels that having the opportunity to experience the rich and active culture of Cyprus has allowed him to gain a better understanding of what it means for a country to have national pride in its own exotic wildlife. Being part of this whole experience allowed him to make friends, not only with team members, but also the local people that were keen to get involved with the great work that we do. He feels the opportunity offered by the University of Glasgow and RAF shows just how important it is to educate and shape the minds of tomorrows Marine and Zoological scientists; to turn today's animal lovers into future wildlife protectors, conservationists and activists. He would recommend this excellent chance to any interested students to get involved in something worthwhile, engaging and career building.

Romaine Furmston-Evans

Romaine feels that participating in Turtlewatch was a wonderfully rewarding experience. She gained invaluable experience of field work whilst helping the conservation effort of a majestic endangered species. It was amazing to feel part of something so big, knowing how long Turtlewatch Akrotiri has been running gave her the knowledge that in a small way she was working to towards something great. As a recently graduated zoologist the benefits were two fold as field work experience is integral to what we do. She is grateful to have had this amazing opportunity and will never forget it.

Adam Butler

Adam believes his experience in Cyprus Turtlewatch earned him invaluable skills in effective beach patrols at night, and how to safely and effectively excavate overdue nests as well as getting as many hatchlings to the sea as possible. He developed skills in managing crowds of members of the public including children, when on occasion we would give them presentations on what we were doing. He has carried these skills over and is currently a member of the marine turtle and amphibian conservation expedition to Tobago in 2012.

Lauren Dingwall

Lauren feels that Turtlewatch was a great opportunity which provided her with essential conservation field experience. Working with endangered marine turtles, in their natural habitat, has given her a greater understanding of why this particular conservation work is so crucial and must continue. Turtlewatch has also developed her team working skills which will be beneficial in any future projects. Lauren will be returning to the team in 2012 as a student leader.

Appendix C: Finances

Income

Source	
Personal contributions	£5,950
Trust funds	
Carnegie Trust	£2,000
Gilchrist Educational Trust	£1000
University court	£1000
Glasgow Natural History Society	£700
Fundraising Events	
T-shirts and hoodies	£1,346
Bake Sales	£914
Band/Ceilidh/Karaoke/Quiz Night	£1,084
Total	£13,994

Expenditure

Flights	£5,312.55
Insurance	£524.34
Food	£3,800
Petrol	£1,100

Pre-expedition cost (first-aid course, printing,	
Postage and extra baggage)	£150
Report costs	£100
Equipment	£150
Total	£11,136.89
Balance (for use in Turtlewatch 2011)	£2857.11

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