Cyprus Turtlewatch 2011 Expedition

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Fig. 1 Fig. 2

(Pictures provided by Jennifer Finnegan. Figure 1: Showing Green Adult Female. Figure 2: Showing a Loggerhead hatchling.)

The purpose of this document is to aid in the planning and organisation of the Turtlewatch expedition to Cyprus proposed for the summer of 2011. In addition to introducing the members of the expedition, this document will also outline the projects that we hope to undertake during the course of this expedition. The expedition will be organized by members of the University of Glasgow Exploration Society and will follow up on work conducted by the previous expeditions to Cyprus.

The expedition also has the full support and approval of the Ministry of Defence (MOD) Cyprus Wildlife Section and will be working in conjunction with RAF Akrotiri and the local environmental centre.
Introduction

Marine turtles can be found in seas worldwide, nesting on tropical and sub-tropical beaches. The Loggerhead turtle, *Caretta caretta*, (figure 3) and the Green turtle, *Chelonia mydas*, (figure 4) can be found nesting at night on beaches in Greece, Turkey, Cyprus, Libya and most recently, Italy. The females of these species will always return to the vicinity of the beach they were born on (natal beaches) to lay. The populations of marine turtles have rapidly declined over the last century due to both human and environmental impacts. *C. mydas* is classified as endangered and *C. caretta* is classified as endangered by the IUCN (International Union for the Conservation of Nature and natural resources). Human pressures include: fishing, illegal trade, light and noise pollution near their natal beaches and habitat destruction. This may deter nesting females resulting in them dumping their eggs in the shallow waters. These human pressures also have a detrimental effect on the hatchlings, confusing their sense of direction resulting in many not making it to the sea.

The developing young are also at great risk during the incubation time. Disturbance of nests by dogs, foxes and humans on the beaches of Cyprus can have a devastating effect resulting in the death of all the offspring. Hatchlings that do survive are subject to environmental threats. Predation by seagulls and foxes is highly prevalent on the nesting beaches, making the hatchlings journey to the sea a hazardous one. In recent years there has been a new pressure on the turtles, global warming. This is a particular concern as turtle sex ratios are environmentally determined by temperature. Both species have a pivotal temperature of 29°C. This is the critical temperature at which temperatures of >29.5°C result in the production of females and low temperatures of <29.5°C result in the production of males. Therefore if global warming continues the production of males will decrease, resulting in a female biased sex ratio.
Turtlewatch is a marine conservation project that was established in 1991 by the Royal Air Force. The main turtle nesting beaches on Akrotiri peninsula are located approximately 7 km from RAF Akrotiri; these beaches are within the Sovereign Base Area (Fig. 5). The University of Glasgow has had students participating for the last twelve years: this is the eleventh year it has been organised through the Exploration Society of Glasgow University. During this expedition the participants will be focusing on the conservation and monitoring of the turtle population in the detailed area.

Glasgow University Exploration Society is planning an expedition to the Akrotiri peninsula in Southern Cyprus, during the summer of 2010. The expedition is planned to last three months, from early June until mid September to coincide with the laying and hatching periods. Each member of the expedition will take part for approximately five weeks.

The expedition has three main aims:

1. To carry out active conservation and research work on the Mediterranean turtles nesting on the beaches of the Akrotiri peninsula in Southern Cyprus.

2. To raise awareness among local inhabitants about the need to conserve marine turtles. This will be achieved by running an information centre and organising public excavations. Throughout the summer there will be a strong emphasis on keeping members of the public updated on our activities.

3. To provide an opportunity for undergraduate students to experience fieldwork that will hopefully be of benefit to them in their future careers.

(Figure 5: Showing a map of Cyprus and the location of the turtle beaches)
Main Objectives

i) Marine turtle monitoring and conservation

There are four main coves (Fig. 9) that the turtles nest on which are situated on the Akrotiri peninsula. These beaches have been monitored for the last 18 years as they cover an area high in turtle activity. The work done by the students is in association with the RAF as they are responsible for these beaches. Beaches on the RAF base itself are also monitored for laying activity.

The beaches off base are monitored at night between the hours of 9pm-6am, for signs of turtle activity, which are then recorded by the expedition leaders and the RAF Turtlewatch coordinator. This data can then be used later in the season to estimate the hatching date of the nests. Loggerhead turtles begin nesting at the end of May and continue until mid August. Hatching takes place from end of July until late September. Green turtles begin nesting at the beginning of June until the middle of August on the Cypriot beaches. Fluctuating weather conditions cause these variations in the nesting season.

As the laying season is so long, the expedition involves a rotation of 3 groups of students each going out to Cyprus for a 5-week period starting from the beginning of June. This has the advantage of allowing many students to participate. The two expedition leaders are out for the duration of the expedition, which allows for consistency of work methods.

Nesting for green turtles can take up to four hours whereas nesting for the loggerheads only takes approximately one hour. All nests located are covered with a mesh cage to reduce predation. The main predation risks are foxes and dogs, which have been introduced to these beaches by humans as a result of the close proximity to Akrotiri village. Each nest is numbered with a sign, in both Greek and English, which warns beach visitors of the location of the nest. Incubation takes about 7 weeks but may vary from 44-60 days and nests are monitored throughout incubation. Hatching occurs between late-July and late September.

In Cyprus, green turtles have been noted to lay up to 215 eggs and loggerheads up to 165 eggs (Fig. 6). The survival number of these hatchlings varies greatly; therefore steps are taken to increase the numbers of hatchlings making it to the sea. Nests which are due to hatch are monitored hourly by night, with any emergent hatchlings being guided to the sea in order to stop light pollution from the village disorientating them and to protect them from predation. On the 10th afternoon after hatching, the nest is excavated to ensure that any distressed or stranded hatchlings are released. These excavations are made public to increase the education available to locals.

The mean nest temperature determines the sex of the embryo during the middle third of the incubation period. It is proposed that the intra-nest temperatures of each nest is recorded in order to determine the sex ratio from each nest which is added to data collected from previous years. This will help establish if global warming is effecting the turtle populations in the Mediterranean.
An aspect of the project that was introduced in 2008 is the use of mini temperature data loggers. These are inserted into the nests in order to record temperatures throughout the incubation period. They will then be recovered when the nest is excavated and the data will be downloaded. This will allow comparisons between nests and may also help to predict the sex ratio of the hatchlings and provide further information about nesting behaviour.

![Fig.6. Relocated nest of Loggerhead eggs (photo provided by Sofie Rogers)](image)

**ii) Public education**

Excavations are an excellent opportunity for both the RAF and local community to be educated. Public nest excavations (Fig 7) are carried out on the 10th afternoon after first natural hatching emergence. At these excavations the public are informed as to why marine turtles need to be conserved and the problems the turtles face through their life cycle. The public are also informed on the detrimental effects their use of the beach can have. For example litter on the beach can be washed into the sea and then eaten by turtles; walking dogs on the beach and allowing children to dig on the beach can result in nest disturbances; night beach parties can scare away laying females; long line fishing can trap turtles leading to drowning and/or injury. Driving cars or 4x4 on the beach also has an extremely destructive effect on the nests.

![Fig.7: Showing public excavation (provided by Francesca Kenney)](image)

As well as these excavations, the students run a shop/information centre on the RAF base on a daily basis, which provides information on the turtles and the projects Turtlewatch carries out. The shop also sells merchandise to help raise funds for Turtlewatch Akrotiri.
Our aim is to encourage people to respect animals and their habitat, understand the need to preserve nature and help protect the endangered marine turtles. It is hoped the work done by the students will encourage others to volunteer on the beaches and have a greater appreciation of their surroundings in Cyprus.

iii) Opportunities for undergraduates

Turtlewatch Cyprus provides an opportunity for students to experience the practical aspects involved in the conservation of marine turtles. The research conducted on the expedition will be an ideal opportunity to improve their fieldwork skills. All students chosen this year are interested in conservation and Zoology and are hoping the expedition will provide invaluable experience for their future careers. The expedition enhances their ability to work in a team, as close teamwork is essential for the expedition to run smoothly both in pre-expedition fundraising and whilst working in Cyprus. Working in the shop enhances their communication skills while they answering the questions of local people. Talking to the public provides an opportunity for the students to pass on their knowledge in simple terms which is an important skill for any scientist. Conveying knowledge to others and hands on experience will boost the students confidence in their own abilities. The important work done on this expedition provides the students with a proud sense of achievement and hopefully a renewed enthusiasm for conservation.

**Project Proposals for 2011**

Our aims for Turtlewatch 2011 involve conducting research work into both the turtles themselves, and their habitat (both physical and biological). We hope that our proposed projects will continue to allow us to contribute valuable data which can be used to ensure the continued protection of both the turtles and the Akrotiri peninsula where they nest. The following are brief project proposals which have been developed in conjunction with the SBA Environmental Agency and Turtlewatch Akrotiri.

**Habitat Determination Studies**
Habitat determination studies will be conducted on nesting beaches throughout the season. This will allow us to gather information on many factors which have been shown to influence turtle breeding success. Vegetation studies, sand temperature profiles, beach gradients, tide levels, human disturbance levels, artificial light levels, coastal development index studies and sand grain size will all be analysed. The collection of this data will allow us to create a profile of all the beaches and will hopefully help us to establish better conservation measures for the habitat.

**Satellite Tracking**
This exciting new project was proposed in a meeting between Turtlewatch and members of the SBAA Environmental committee in 2008. Unfortunately, the Cypriot Government decided against this project in 2009 and 2010, but we are planning to reinvent the project proposal outlined to them and hopefully gain their approval for the 2011 season. It will involve purchasing satellite trackers and Argos satellite time. This project will be partially funded in 2011 by the Ministry of Defence but will be subsidised by Turtlewatch. Tracking turtles in this manner is crucial to their conservation as it allows research to be conducted into their foraging habitats, migratory routes and breeding grounds.
Tagging Nesting Females
This procedure will be undertaken using either PIT tags or metal clips, which would allow data to be collected on the following: beach selection, number of nests laid, frequency of laying by an individual. Training is required for this method of research and a PIT tag reader is also required. Again, the proposal for this project was declined by the Cypriot Government decided in the 2010 season, but we are planning to adjust the project proposal to the feedback that was given and hopefully gain their approval for the 2011 season.

Post Mortems
Post Mortems will be performed by a trained veterinarian on expired turtles which arrive on our study beaches. We will take these deceased turtles to a trained military vet in Episkapi. This procedure will ascertain the age, sex and general health of the turtle. Toxicology levels and the cause of death can also be determined by this work. We will keep details about these recordings and apply it to long term data sets and use it to influence conservation practices.

Ghost Crabs (Ocypode cusor) Studies
Studies will be conducted on the population of Ghost crabs (Ocypode cusor) which are endangered and reside on our study beaches. Studies will include collecting data on the following: vertical distribution of burrows and crabs, density studies, burrow measurements, feeding behaviour studies, bait trap attraction, orientation preference, size distribution, human disturbance index and burrow temperature profiles. The crabs also interact with the turtles. They burrow into nests and consume the eggs and we aim to establish the extent of this interaction.

Incubation Temperature Profiles
Nest temperature data collection will be repeated in a similar way to 2008-2010 procedures. This will involve placing Tiny Talk temperature data loggers (TDL) into the nests of laying females in order to determine the average incubation temperature. This will allow us to predict a sex ratio. Controls will be set up in hand-dug “nests” at points on specific nesting beaches with TDL in them. This will allow us to determine if metabolic heating is present within clutches. Nest depths will also be recorded upon excavation of the nest.

Hatchling Dispersal Patterns
Projects will be implemented to establish hatchling dispersal patterns upon emergence from the nest. This will involve using a specific size of Perspex ring placed around a nest and divided into equal segments to record the tracks of the hatchlings. This will allow us to conclude if hatchlings regularly orientate themselves towards the sea. The size, orientation and angle of the moon will be noted to aid this study.

Turtle Footage
We intend to facilitate filming footage of both hatchlings and adults in the 2011 season to establish natural behaviour patterns. We hope to have large red-light torches to aid this process, along with a sensitive camera/recorder.

Sex Determination Research
We hope to ascertain a hatchling sex ratio for individual nests on the study beaches. We intend to do this by taking eggs from a nest during excavations, which expired at a late stage of development. Their gonads have developed by this time and we wish to preserve them in order to return them to the UK, with the permission of a CITES licence, and then perform...
gonad dissection at Glasgow University. This will allow the determination of an inter-nest sex ratio and contribute to a long-term data set about population dynamics.

**Relations with Environmental Centre**
We will build upon the positive relationship previously established with Akrotiri Environmental Centre and the Akrotiri fishermen.

**Insect Infestation of Nests**
We intend to establish which Dipteran, or other insect species, infest turtle nests on the study beaches. This will be achieved by taking larval samples during nest excavations, allowing them to pupate, then placing adult flies in the freezer and preserving them. They will then be transported back to Glasgow University for further identification.

**Barnacle Distribution Studies**
We also propose to perform a study on the barnacle distribution on adult female carapaces.

**Timing and Location**

The expedition is planned to last three months from approximately 2nd June until 12th September 2011. Students will participate in three separate groups, each for a duration of five weeks. Seven members will participate in the project at any one time - the two leaders and five other students. All fieldwork will take place within the Western Sovereign Base Area on Akrotiri peninsula, Southern Cyprus.

Fig. 8 Map showing location of coves (Downie, 2006)
**Accommodation**

In previous years accommodation has been provided in the Temporary Accommodation at RAF Akrotiri, about 7 kilometres from the turtle nesting beaches, and it is expected to be the same for 2011.

**Transport**

**Transport to Cyprus:**

Glasgow to Paphos by scheduled airline.

**Transport within Cyprus:**

A four-wheel drive vehicle will be available to us, kindly donated by the Welfare section of RAF Akrotiri in 2000. It will be driven by fully licensed UK drivers.

**Safety Considerations**

All potential health and safety risks have been considered. A full fieldwork safety risk assessment has been carried out conforming to the standards set for all Glasgow University Institute of Biomedical and Life Sciences fieldwork. It is standard practice for all fieldwork to be carried out in groups, and lone fieldwork is not permitted. All groups have at least one member with first aid experience and certification, and all project leaders will complete fieldwork first aid courses prior to commencing the expedition. Travel advice has been sought from the Foreign and Commonwealth Office at www.fco.gov.uk.

**Personnel (17)**

The group incorporates a variety of students from different academic years and academic backgrounds, allowing the more advanced students to pass on their knowledge and experiences.

**Leaders: Faye Honeyman & Kirsten Fairweather**

**Faye Honeyman** is a 22 year old fourth year Zoology student. After helping lead the expedition last year she is keen to return to Cyprus for the 2011 season as she found it an immensely rewarding and enjoyable project. She hopes to continue the work started last year, as well as educating new members in the various projects under way. She has a full UK driving licence.

**Kirsten Fairweather** is 21 years old and is a third year Zoology student. She is looking forward to leading the expedition over summer 2011 and gaining many skills useful for when she leaves university.

**Fionntan McCabe** is 21 years old studying second year Biology. He is very interested in animal conservation and was a member of the 2010 Turtlewatch expedition. He feels that
this further firsthand experience working with exotic wildlife will help him gain the skills necessary for a career in conservation.

**Hazel Gibson** is 21 years of age and in the middle of studying fourth year Zoology. This will be her second time on a Cyprus Turtlewatch expedition and she is looking forward to going back out to Cyprus to continue the good work of last year.

**Alistair Green** is a 20 year old, who plans to gain a degree in Zoology. He is currently in second year. He is passionate about conservation and sustainable development. He is returning to Turtlewatch this year as he feels the experience he gained on last year’s expedition will help him perform conservation work to an even higher level.

**Kathryn Nairn** is a 19 year old third year Immunology student. This will be her second Cyprus expedition and is looking forward to going to Cyprus because she is interested in conserving wildlife. She is looking forward to doing her bit to help protect the endangered populations of green and loggerhead turtles, and thinks it will be a great experience that will enable her to develop key team working skills.

**Virginia Woollven** is 21 and is currently studying fourth year zoology. Studying animals in their natural environment is something that has always interested her and so she is returning to Cyprus this year in order to help further in marine turtle conservation.

**Emma Hargreaves** is 20 and in her third year studying Geography. She thinks Turtlewatch offers a superb opportunity to do worthwhile conservation work with very special creatures, and would gain valuable field work experience as well as developing teamwork skills in an unusual environment which not very many people get to experience. Last year she learned a huge amount about conservation work with turtles and made good, lifelong friends and this year is looking do to the same. The five weeks is a lot of work but fun at the same time and is an opportunity not to be missed.

**Adam Butler** is a 20 year old third year Zoology student. He is very excited to be working with endangered species such as Green and Loggerhead turtles as he feels it will be very rewarding and would be brilliant to witness spectacles such as laying first hand.

**David Bryden** is 20 years old and a third year Zoology student. He is keen to participate in the expedition to help towards the conservation effort for sea turtles in Cyprus. This is his first experience of an expedition and he feels that he will learn many skills that will benefit his future career.

**Simon Gray** is a 20 year old student studying third year Zoology. He is looking forward to going to Cyprus and working with the turtles to gain experience in conservation and to do his part for turtle conservation.

**Hannah Lafferty** is 18 years old and in her second year of study. This is her first time on Turtlewatch and she is really looking forward to the experience as she is hoping to be a Zoologist in the future and work with a range of animals.

**Kristopher Houston** is 21 and currently in his third year of university studying Zoology. He is excited to be a part of Turtlewatch as gives him an opportunity to further his interest in reptiles and spend his time working for a good cause.
**Romaine Furmston-Evans** is a 21 year old Zoology student in her final year at university. This will be her first experience of an expedition and she is looking forward to going to Cyprus to help toward the conservation effort towards sea turtles as she feels it is a great opportunity to work for such a cause.

**Roisin Lyle-Collins** is a 19 year old student studying Zoology. She is looking forward to being out in Cyprus to develop research skills towards her degree and gain experience in her field of interest as well as being able to meet new people and see more of the world.

**Elaine Jenkins** is a 21 year old third year student studying Zoology. She is looking forward to a rewarding experience helping in turtle conservation. She loves turtles and can't wait to see them up close. It will be an experience she will always remember.

**Lauren Dingwall** is 22 years old and studying second year Biology intending to study Zoology next year. She feels the expedition will be a great opportunity to gain experience working with wildlife and in the conservation field. She is looking forward to seeing turtles in their natural environment and also being part of the education aspect of the expedition.

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**Adviser**

**Isabel Coombs, Liaison Officer.** The Liaison Officer for Turtlewatch since 2000. A senior university teacher in Parasite Biology and an experienced field trip co-ordinator.

Although no members of staff from The University of Glasgow are accompanying our expedition we have the supervision of some committed volunteers in Cyprus, including the Turtlewatch co-ordinator.

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**Collaborators**

**Sgt Jason Smith, Turtlewatch Akrotiri Co-ordinator.** Jason took on the co-ordinator role in the summer of 2010 working with previous co-ordinator Sgt Clive Burt. As Coordinator of WSBA Turtlewatch Akrotiri Group he is responsible for:

- Organising beach clearances prior to the commencement of the turtle-nesting season. Organising the upkeep of the signing and marking of the turtle breeding beaches.
- Organising all nest excavations during the breeding season.
- Supervising the student volunteers and briefing them on their responsibilities while hosted by RAF Akrotiri.
- Supervision of the Turtlewatch Information Centre.
- Liaison with Akrotiri’s Accommodation cell and Catering Squadron.
- To advise local and international based environmental groups on WSBA Turtlewatch activities.
- Liaison with the students from Glasgow University during the off-season to co-ordinate future volunteer teams.
- Presentations on Turtlewatch activities to the local community.
- Keep the OIC Turtlewatch up to date with current activities.
• Act as first point of call for SBA Police in the rescuing and recovering of injured turtles on SBA soil.

**Cpt Simon Blyth is the current Officer in Charge (OIC).** Simon took over as Officer in Charge in May 2010. His job involves overseeing the Turtlewatch project, and is currently the OIC of WSBA Turtlewatch and is responsible for RAF Akrotiri, Episkopi and Pissouri Turtlewatch. All major policy changes must have his approval.

**Cost Estimations**

Cost is based on 17 undergraduate students for duration of five weeks each, and is estimated from the cost of previous years.

**Travel**
- Return Flights, Glasgow-Paphos $\times (17 \times £300) = £5100$
- Insurance $\times (17 \times £30) = £510$
- Fuel in Cyprus $\times £1500$

**Disposables**
- Food at £3.70 per person per day $\times £2700$
- Administration and report $\times £200$
- Equipment $\times £2000$
  - (Replacement nests, red-light torches, buckets, data loggers, waterproof blankets, supplies for first-aid kits, Cypriot sim cards, crab traps, tagging equipment, GPS device, filming equipment etc)
- Pre – expedition costs $\times £200$
  - (First-aid training, extra baggage allowance for equipment, mail-shots etc)

**Total (less contingency)** $\times £12210$

**Contingency (10%)** $\times £1221$

**Grand Total** $\times £13431$

**Funding**

- Contribution by members (£350 each) $\times £5950$
- Fund-raising efforts organised by members (estimate) $\times £2600$
- **Remaining funds to be raised** $\times £4881$

**Bodies to be approached for additional funding include:**
Glasgow Natural History Society, Gilchrist Educational Trust, University Court- The University of Glasgow, The Carnegie Trust for the Universities of Scotland, Selective conservation and animal welfare trusts and commercial organisations.
References


J. R. Downie, 2003, Turtlewatch: collaboration between the university of Glasgow and RAF Akrotiri to protect marine turtles in Cyprus, Testudo, Vol 5 (5)