

Darwin Initiative for the Survival of Species

Annual Report

1. Darwin Project Information

Project title	Assessing the status of Ascension Island turtles
Country(ies)	UK, Ascension Island
Contractor	University of Wales Swansea
Project Reference No.	07/006
Grant Value	144,005
Start/Finishing dates	01/10/1998-31/3/2002
Reporting period	1/4/2000-31/3/2001

2. Project Background

- Briefly describe the location and circumstances of the project and the problem that the project aims to tackle.

The project is undertaken on Ascension Island, UK where one of the most important green turtle populations in the Atlantic come to nest each year. The population had been understudied and with increasing fiscal challenges on Ascension Island, the turtles had been highlighted as a possible source of revenue through ecotourism. The thread that ran through the whole Darwin project was to study the turtles, assess any threats to their conservation and develop a management plan so that they could be used as part of an ecotourism industry.

3. Project Objectives

- State the purpose and objectives (or purpose and outputs) of the project. Please include the Logical Framework for this project (as an appendix) if this formed part of the original proposal or has been developed since, and report against this.

There were four fundamental research outputs of the project:

Objective 1: Assess the size of the nesting population. A detailed monitoring operation was put in place so that the population might be fully assessed in both the 1998/99 and the 1999/00 seasons and data successfully collected from both seasons. This involved in excess of 30 people and hundreds of man-hours monthly: Project staff and volunteers from all sectors of the community (St. Helenian, British military and civilian, US military and civilian). Ongoing data collection has been ensured through a new project funded by the Foreign and Commonwealth Office Environment Fund for the Overseas Territories: Monitoring and Conservation of Marine Turtles of Ascension Island: a Sustainable Resource.

Objective 2: Assessing the sex ratio of hatchling production. Nest temperature studies have been very successful. By recording temperature at control sites at nest depth and in 39 green turtle nests using small temperature recording devices, the sex ratio of hatchlings was ascertained in a sub-sample of monitored nests allowing the description of the relationship between intranest temperature and hatchling sex ratio, demonstrating a pivotal incubation temperature of 28.8°C. The seasonal profile in sex ratio of hatchlings produced on all nesting beaches at Ascension Island was estimated, showing that a female biased sex ratio would be expected with a female: male ratio of the order of 3:1.

Objective 3: Measuring the reproductive output of nesting turtles was monitored throughout both study seasons. A large number of turtles was weighed to assess body condition and their clutches investigated for egg number, egg size, egg weight and density. These data are now under review for publication.

Objective 4: Demonstrating migratory pathways and foraging grounds of post-nesting females. Satellite transmitters were attached to 9 turtles. Movements have been analysed illustrating where these turtles forage between breeding seasons and giving an insight into how they navigate.

- Have the objectives or proposed operational plan been modified over the last year and have these changes been approved by the Darwin Secretariat?

All objectives and milestones have been on or ahead of schedule. As agreed by the Darwin Secretariat, the funding for the Project Officer for the final 6 months of the project was extended into part-time funding until Feb 2002 with additional outputs.

4. Progress

- Please provide a brief history of the project to the beginning of this reporting period. (1 para.)

Up until the beginning of this reporting period the project had proceeded as planned with all objectives and milestones being achieved on or ahead of schedule. The project had therefore been a great success.

- Summarise progress over the last year against the agreed baseline timetable for the period. Explain differences including any slippage or additional outputs and activities.

The progress of the project has again proceeded as planned with all milestones and objectives being met on or ahead of schedule. The fieldwork and lab work all having been completed, most of the current reporting period was spent producing research and other reporting outputs. There were no slippages in the timetable and additional outputs include the securing of an additional grant to allow two more years monitoring and a full development of the ecotourism potential of the green turtles on Ascension Island; this work has completed its first season.

Key milestones met in the reporting period:

- June 2000** completion of second field work season- on time
- July 2000** assessment of interannual variability of nesting density- on time
- Sept 2000** preparation of material for Sea Turtle symposium- completed and presented
- Oct 2000** compilation of satellite tracking data- ahead of schedule
- Nov 2000** preparation of draft management plan- ahead of schedule
- March 2001** discussions with Administrator- ahead of schedule leading to new initiative.

- Provide an account of the project's research, training, and/or technical work during the last year. This should include discussion on selection criteria for participants, research and training methodologies as well as results. Please **summarise** techniques and results and, if necessary, provide more detailed information in appendices (this may include cross-references to attached publications)

As stated above, this last year has been focussed on writing up the results of the work and further dissemination of the results at domestic and international symposia. This has been a great success with a large number of publications and well received lectures at International Symposia.

- Discuss any significant difficulties encountered during the year.

There were no significant difficulties throughout the last year

- Has the design of the project been enhanced over the last year, e.g. refining methods, indicators for measuring achievements, exit strategies?

We were delighted to see the exit strategy evolve into an ongoing Initiative with Ascension based monitoring, tour guiding, educational tours and lectures all being undertaken, generating revenue for the local economy.

- Present a timetable (workplan) for the next reporting period.

The timetable for the next reporting period is as negotiated:

New Outputs April 2001-Feb 2002

April 2001	11B	submission of sixth peer-reviewed paper
May 2001	15A	11 th newspaper article on Ascension
July 2001	11 B	submission of seventh peer reviewed paper
August 2001	15A	12 th newspaper article on Ascension
November 2001	11B	submission of eighth peer reviewed paper
December 2001	15A	13 th newspaper article on Ascension
February 2002	11A	anticipated publication of sixth peer-reviewed paper

New Milestones April 2001-Feb 2002

June 2001:	Completion of histological sexing data
September 2001:	Setting up IT lab for the comparison of satellite tracks with remote sensing images of sea surface temperature
October 2001:	Development of robust techniques for interpretation of satellite tracking data
February 2002:	Development of techniques for prediction of historical sand temperatures on Ascension.

5. Partnerships

- Describe collaboration between UK and host country partner(s) over the last year. Are there difficulties or unforeseen problems or advantages of these relationships?

The collaboration between the University of Wales, Swansea and all local organisations has been greater than expected. The relationship with the main stakeholder in the Darwin project, the Ascension Island Administrator, has led to an extended partnership through the Foreign & Commonwealth Office funding and the stimulation of the formation of a new NGO: the Ascension Island Turtle Group.

- Has the project been able to collaborate with similar projects in the host country or establish new links with / between local or international organisations involved in biodiversity conservation?

Other than the productive relationship with the Administrators Office and the incipient local conservation NGO, the project has pulled together all on Island organisations involving them in some way. The organisations involved to date include:

Ascension Island Heritage Society

Ascension Island Society for the Protection of Animals

Ascension Island Services

Cable and Wireless

Computer Services Raytheon

Curnow Shipping
 First Ascension Scout Group
 Islander Newspaper
 Maersk line
 Merlin Communications Ltd.
 Meteorological Office
 Royal Air Force
 Sea lift
 Two Boats School
 United States Air Force.

6. Impact and Sustainability

- Discuss the profile of the project within the country and what efforts have been made during the year to promote the work. What evidence is there for increasing interest and capacity for biodiversity resulting from the project? Are satisfactory exit strategies for the project in place?

During the year, we have continued to write articles for the local press, the leaflet designed as part of the Darwin project with FCO funding in 1999 is still distributed to every island visitor. The sustainability of the project has far exceeded our expectations with twice weekly turtle tours being run by the Ascension Island turtle Group, with fees levied being translated into wages for turtle monitoring, allowing threats to the population to be identified and the long term status of the population to be assessed. We therefore surmise that the exit strategy which was in place at the end of the 99/00 season has worked well.

7. Outputs, Outcomes and Dissemination

- Please expand and complete Table 1. **Quantify** project outputs over the last year using the coding and format from the Darwin Initiative Standard Output Measures (see website for details) and give a brief description. Please list and report on appropriate Code Nos. only. The level of detail required is specified in the Guidance notes on Output Definitions which accompanies the List of Standard Output Measures.

Table 1. Project Outputs (According to Standard Output Measures)

Code No.	Quantity	Description
6a	16	No. people receiving short term training
6b	32	Weeks of short term training
7	2	Training material for host country
8	73	No. weeks UK staff in host country
9	1	Management plan

11a	13	Papers in peer reviewed journals
11b	5	Papers elsewhere
12a	2	Computer data-bases established
12b	1	Computer data-bases enhanced
14a	2	Workshops in host country
14c	2	Workshops attended in host country
14d	2	Conferences attended elsewhere
15a	13	National press releases in host country
15b	13	Local press releases in host country
15c	5	National press releases or articles in UK
15d	3	Local press releases or articles in UK
17a	1	Dissemination networks established in host country
18d	1	Local TV programmes in UK
19a	1	National radio interviews in host country
19b	2	National radio interviews in UK
19c	1	Local radio interviews in host country
19d	1	Local radio interviews in UK
21	1	Permanent facilities established
22	30	Permanent field plots established

- Explain differences in actual outputs against those agreed in the initial ‘Project Implementation Timetable’ and the ‘Project Outputs Schedule’, i.e. what outputs were not achieved or only partly achieved? Were additional outputs achieved?

All outputs have been maintained. We have, so far, produced 13 refereed journal publications which is in excess of that expected.

- In Table 2, provide full details of all publications and material produced over the last year that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Details will be recorded on the Darwin Monitoring Website Publications database which is currently being compiled. Mark (*) all publications and other material that you have included with this report

Table 2: Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Journal	The navigational feats of green sea turtles migrating from Ascension Island investigated by satellite telemetry. Luschi P, Hays GC, Del Seppia C, Marsh R, Papi F (1998)	Proceedings of the Royal Society B 265 : 2279-2284.	n/a	n/a
Journal	The long term thermal conditions on the nesting beaches of green turtles on Ascension Island. Hays GC, Godley BJ, Broderick AC (1999)	Marine Ecology Progress Series 185 : 297-299.	n/a	n/a
Journal	Changes in behaviour during the internesting period and postnesting migration for Ascension Island green turtles. Hays GC, Luschi P, Papi F, del Seppia C, Marsh R (1999).	Marine Ecology Progress Series 189 : 263-273.	n/a	n/a
Journal	The diving behaviour of green turtles at Ascension island. Hays GC, Adams CR, Broderick AC, Godley BJ, Lucas DJ, Metcalfe JD, Prior AA (2000)	Animal Behaviour 59 : 577-586.	n/a	n/a
Journal	The implications of variable remigration intervals for the assessment of population size in marine turtles. Hays GC (2000)	Journal of Theoretical Biology 206 : 221-227.	n/a	n/a
Journal	Open-sea migration of magnetically disturbed sea turtles. Papi F, Luschi P, Åkesson S, Capogrossi S, Hays GC (2000).	Journal of Experimental Biology 203 : 3435-3443	n/a	n/a
Journal	Nesting of green turtles <i>Chelonia mydas</i> at Ascension Island, South Atlantic. Godley BJ, Broderick AC, Hays GC (2001).	Biological Conservation 97 : 151-158.	n/a	n/a

Journal	Movements of migrating green turtles in relation to AVHRR derived sea surface temperature. Hays GC, Dray M, Quaife T, Smyth T, Mironnet NC, Papi F, Luschi P, Barnsley MJ (in press).	International Journal of Remote Sensing.	n/a	n/a
Journal	Metabolic heating and the prediction of sex ratios for green turtles (<i>Chelonia mydas</i>). Broderick AC, Godley BJ, Hays GC (2001).	Physiological and Biochemical Zoology 74 : 161-170.	n/a	n/a
Journal	The importance of sand albedo for the thermal conditions on sea turtle nesting beaches. Hays GC, Ashworth JS, Barnsley MJ, Broderick AC, Emery DR, Godley BJ, Henwood A, Jones EL (in press)	Oikos	n/a	n/a
Journal	The movements and submergence behaviour of male green turtles at Ascension Island. Hays GC, Broderick AC, Glen F, Godley BJ, Nichols WJ (in press).	Marine Biology	n/a	n/a
Journal	The implications of location accuracy for the interpretation of satellite tracking data. Hays GC, Åkesson S, Godley BJ, Luschi P, Santidrian P (in press)	Animal Behaviour	n/a	n/a
Journal	Trophic status drives inter-annual variability in nesting numbers of marine turtles. Broderick AC, Godley BJ, Hays GC (in press).	Proceedings of the Royal Society of London B	n/a	n/a

- Provide details of dissemination activities in the host country during the year. Will these activities be continued by the host country when the project finishes, and how will this be funded and implemented?

Twice weekly turtle tours are held each week for both Island residents and visitors; the Ascension Island Administrator is ensuring that each and every visitor received an informational leaflet; there is a weekly advert running in the local newspaper; the local Heritage society have an exhibit planned dedicated to natural history and centred around marine turtles and the results of the Darwin project.

8. Project Expenditure

- Please expand and complete Table 3.

Table 3: Project expenditure during the reporting period

Item	Budget	Expenditure
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- Highlight any recently agreed changes to the budget and explain any variation in expenditure where this is +/- 10% of the budget

In September 2000 the budget was revised and the project extended in agreement with Valerie Richardson (DETR).

9. Monitoring, Evaluation and Lessons

- Discuss methods employed to monitor and evaluate the project this year. How can you demonstrate that the outputs and outcomes of the project actually contribute to the project purpose? i.e. what indicators of achievements (both qualitative and quantitative) and how are you measuring these?

We have consistently kept up with all key milestones as per initial contract. We feel that the Darwin legacy speaks for itself: the main initial aim has been satisfied and additionally a huge body of scientific knowledge has been attained regarding this most precious of biological resources, redressing previous imbalances.

- Are there lessons that you learned from this years work and can you build this learning into future plans?

Two of the main findings of this years analyses were that the nesting was not evenly distributed around the Island and hatchling sex ratio of the population was highly skewed towards female. Given that turtles are subject to environmental sex determination, with high temperatures in the nest leading to more females, this skew will be more pronounced on some beaches. Future plans include: (1) prioritisation for protection of the different beaches of Ascension with regard to any future development. (2) elaboration of more effective management strategies to maximise hatchling production should the population go into decline.

10. Author(s) / Date

Graeme C. Hays

24 April 2001