ASSESSING THE STATUS OF THE ASCENSION ISLAND GREEN TURTLES

Darwin Initiative for the Survival of Species

Final Report

Contractor: *University of Wales Swansea*

CONTENTS

1. Darwin Project Information

Project title	Assessing the status of Ascension Island green turtles
Country	Ascension Island
Contractor	University of Wales Swansea
Project Reference No.	162/7/006
Grant Value	144, 005
Staring/Finishing dates	1/10/98-31/3/2002

2. Project Background/Rationale

- **Describe the location and circumstances of the project**
- **What was the problem that the project aimed to address?**
- **Who identified the need for this project and what evidence is there for a demand for this work and a commitment from the local partner?**

The project was undertaken on Ascension Island, UK where one of the most important green turtle populations in the Atlantic comes 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. The need for the project was identified by Dr Hays in preliminary field studies after discussions with the Ascension Island Administrator (The UK Government Representative) at that time Roger Huxley. As an in kind contribution of £25 000, the Administrator waived the Common Services Charge for the Project Officer over two years.

3. Project Summary

- **What were 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. This involved in excess of 30 people and hundreds of man-hours each month: Project staff and volunteers from all sectors of the community (St. Helenian, British military and civilian, US military and civilian). This work has been published in peer reviewed journals. Ongoing data collection has been ensured through an additional 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*" (£43,000; Oct 2000-Sept 2002). Through this, additional infrastructure has

been put in place to allow low level sustainable turtle watching to be carried out. This included the establishment of a conservation education centre, the production of an educational video, a slide presentation and poster displays at key sites and trained personnel to run turtle-tours

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. This work has resulted in a number of peer-reviewed publications.

Objective 3: Measuring the reproductive output of nesting turtles. 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 have resulted in one peer-reviewed publication with further publications in preparation.

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. This work has resulted in a number of peer-reviewed publications.

- **Were the original objectives or operational plan modified during the project period? If significant changes were made, when was approval given by the Darwin Secretariat?**

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.

- **Which of the Articles under the Convention on Biological Diversity (CBD) best describes the project? Summaries of the most relevant Articles to Darwin Projects are presented in Appendix I.**

Article 12. Research and Training

- **Briefly discuss how successful the project was in terms of meeting objectives. What objectives were not achieved, or only partly achieved, and have there been significant additional accomplishments?**

All objectives and milestones have been reached on or ahead of schedule. Additional funding by the Foreign and Commonwealth Office Environment Fund for the Overseas Territories enabled a further 2 seasons to be monitored which not only increased our knowledge of the nesting populations of marine turtles at Ascension Island but also enabled continuation of the building of infrastructure to support an ecotourism initiative. As a consequence there is now a Conservation Centre with slides, posters and a video to provide further information. Organised Turtle Tours are now in place 2-3 times a week throughout the nesting season, and more importantly plans are underway to

protect the three major nesting beaches and coastal waters and have them designated as RAMSAR sites under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) with legislation being drafted to allow designation of local National Nature Reserves.

4. Scientific, Training, and Technical Assessment

- **Please provide a full account of the project's research, training, and/or technical work.**
- **Research - this should include details of staff, methodology, findings and the extent to which research findings have been subject to peer review.**

The research supported by this Darwin Initiative Project has been highly successful and this can be judged on several levels. Primarily, the wealth of peer-reviewed scientific papers resulting from this work (>18 to date) summarises the worthiness and quality of the work. This work has involved a great deal of community participation which has contributed greatly to productivity: as all sections of the local business and residential community have been involved with the turtle project donating volunteer time (often highly specialised e.g. crane drivers, stevedores, technicians) and significant infrastructure resources such as ship time and free use of heavy machinery, workshops and consumables. Finally, the work has not only involved Darwin Project personnel and the local community but has also attracted the collaboration of scientists in the UK and internationally including: Italy, USA and Sweden. This aspect has meant additional resources valued at of tens of thousands of pounds have been input into the project in the form of Academic time, data analyses, and equipment.

- **Training and capacity building activities – this should include information on selection criteria, content, assessment and accreditation.**

To date over 40 people have been trained in marine turtle monitoring techniques. These have been volunteers from all sectors of the community (St Helenian, UK and USA). The perennial problem with Ascension Island is that there is no indigenous community with all individuals on the island being short-term contractors or their dependants. However, currently the Ascension Island Turtle Group appears to have reached a critical mass at current time where sufficient trained individuals are present to allow vertical transmission of information and skills.

5. Project Impacts

- **What evidence is there that project achievements has led to the accomplishment of the project purpose? Has achievement of objectives/outputs resulted in other, unexpected impacts?**

All aims and outputs of the project have been achieved. Many additional outputs have also been achieved. The project is now well established on island and there are many trained individuals in place. The unexpected impacts of the project include demonstrable increase in awareness and goodwill towards the turtles and their conservation. Outward examples of these include the production of a souvenir stamp set on Ascension dedicated to the project, a voluntary moratorium on driving behind the main nesting beach at Long Beach, the establishment of a conservation education

centre and the current work in progress to designate the key nesting sites as RAMSAR sites and National Nature Reserves; the first protected areas on Ascension Island

- **To what extent has the project achieved its goal, i.e. how has it helped the host country to meet its obligations under the Biodiversity Convention (CBD), or what indication is there that it is likely to do so in the future? Information should be provided on plans, actions or policies by the host institution and government resulting directly from the project that building on new skills and research findings.**

It would appear that the project has gone a long way towards achieving CBD goals. Awareness of marine turtle biology and conservation is at an all time high on Ascension. The community is participating in the monitoring, research and conservation efforts. Legislation is in preparation for protected areas which will also be put forward as RAMSAR sites, 2 full-time conservation officers are now in place and have received training in marine turtle monitoring techniques.

- **Please complete the table in Appendix I to show the contribution made by different components of the project to the measures for biodiversity conservation defined in the CBD Articles.**
- **If there were training or capacity building elements to the project, to what extent has this improved local capacity to further biodiversity work in the host country and what is the evidence for this? Where possible, please provide information on what each student / trainee is now doing (or what they expect to be doing in the longer term).**

The Ascension Island Turtle Group has been established as a result of this project. Members of this group are involved in monitoring of nesting beaches, conducting Turtle Tours, manning the Conservation Centre, reporting any problems to the recently appointed Ascension Island Government Conservation Officer. In addition the Conservation Officer is also involved in the above activities and deals with any existing problems. Basic monitoring is currently being funded by the FCO Environment Fund for the Overseas Territories. Proceeds from Turtle Tours will allow the tours and manning of the Conservation Centre to be self-sufficient. Now that there are trained individuals in Ascension Island basic monitoring could continue with minimal funding from external sources.

- **Discuss the impact of the project in terms of collaboration to date between UK and local partner. What impact has the project made on local collaboration such as improved links between Governmental and civil society groups?**

Because of the extended timeframe of the Darwin Project and the extended funding by FCO, the UK Darwin Project personnel are still in regular contact with the Ascension Island Administrator, the AIG Conservation Officers and members of the AITG. However, we feel we have been catalytic in drawing those involved in government and those interested in conservation within the wider society closely together.

- **In terms of social impact, who has benefited from the project? Has the project had (or is likely to result in) an unexpected positive or negative**

impact on individuals or local communities? What are the indicators for this and how were they measured?

There are several ways in which there has been a beneficial social impact of the project: Ascension Island is a very unusual place in that all individuals are less than retirement age and all island residents are under contract to one of the on Island organisations. Thus although unemployment in the traditional sense is non-existent, there are few opportunities for part-time employment for the youth or accompanying spouses. Each year over the last 4 years the project has provided part-time employment for at least two spouses and two teenage school students. To date, three of these have passed to full-time employment with Darwin Project personnel acting as referees.

In addition to those employed by the project, more than 20 other adults have been involved in volunteering to do track counting, weighing adults and helping with the logistics of the displacement experiments carried out to help gain an understanding of the navigational capabilities of the turtles. This tremendous volunteer effort has not only increased productivity of the project but has contributed positively to alleviation of boredom and excessive alcohol consumption which are acknowledged social problems on the island (pers comm. S. Sukhtanker, Senior Medical Officer).

There has been great involvement by the general youth. All school students have been involved with the turtle project through the school and/or the active youth groups on the Island. Examples of these include the children's involvement with the design of the stamps and souvenir first day cover, as well as posters distributed on nesting beaches.

6. Project Outputs

- **Quantify all project outputs in the table in Appendix II using the coding and format of the Darwin Initiative Standard Output Measures.**
- **Explain differences in actual outputs against those in the agreed schedule, i.e. what outputs were not achieved or only partly achieved? Were additional outputs achieved? Give details in the table in Appendix II.**
- **Provide full details in Appendix III of all publications and material 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.**
- **How has information relating to project outputs and outcomes been disseminated? Will this continue or develop after project completion and, if so, who will be responsible and bear the cost of further information dissemination?**

We met all outputs as agreed in the project proposal and as renegotiated. We have regularly updated the people of Ascension Island as to our research finding in public seminars and local newspaper articles.

The publication of all journal articles has been widely advertised (on our web site, by the individual journals and in the Recent Publications section of the Marine *Turtle Newsletter* <http//www.seaturtle.org/mtn/>) and are distributed freely upon request in addition to being sent to key individuals upon publication. The *Management Plan* has been widely distributed to key individuals and will be made available as a pdf from our web site. A hard copy can be obtained from the authors. We shall continue to distribute these publications upon request.

7. Project Expenditure

- **Tabulate grant expenditure using the categories in the original application**
- **Highlight agreed changes to the budget**
- **Explain any variation in expenditure where this is +/- 10% of the budget**

Project expenditure

Item	*Budget*	*Expenditure*

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

In September 1999 the budget was supplemented to cover the maternity leave for one of the researchers, Dr Annette Broderick, and then in November 2000 an extension to the project was agreed (although this involved no increase to the budget). Both changes were conducted in discussion with, and agreed by, Valerie Richardson.

8. Project Operation and Partnerships:

- **How many local partners worked on project activities and now does this differ to initial plans for partnerships? Who were the main partners and the most active partners, and what is their role in biodiversity issues? How were partners involved in project planning and implementation? Were plans modified significantly in response to local consultation?**

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. In addition in 2001 an Ascension Island Government Conservation Officer and an RSPB Conservation Officer have been appointed on-island both of whom have been working closely with turtles. As such the AITG are involved in basic monitoring and education whilst the Conservation Officers are involved in the management and liaison with government agencies and on-island organisations. In addition the Conservation Officers are taking the lead in establishing protected areas on-island for turtles in addition to other endangered species.

Other than the productive relationship with the Administrator's 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.

- **During the project lifetime, what collaboration existed with similar projects elsewhere in the host country? Was there consultation with the host country Biodiversity Strategy (BS) Office?**

During the course of the project we have been in extensive contact with the RSPB and visiting scientists (Peter and Myrtle Ashmole; and RAF ornithologists) concerning cat eradication and bird monitoring. We were also involved in advising P and M Ashmole Authors of *Natural History of Ascension Island and St Helena* regarding turtle material. In addition during a visit to St Helena we made contact with the Darwin Officer of the Darwin Initiative Wire Bird Project. There were no other resident biologists on the island during this project. There is no BS Office on Ascension Island.

- **How many international partners participated in project activities? Provide names of main international partners.**

Additional research projects arose as a result of our presence on island with Dr Paolo Luschi and Dr Floriano Papi of the University of Pisa, Italy and Dr. Susanne Akesson of the University of Lund. In collaboration with them we were involved in several studies into marine turtle navigation. Additionally, we collaborated with Dr. W.J. Nicholls, USA on the migration of male green turtles from Ascension.

- **To your knowledge, have the local partnerships been active after the end of the Darwin Project and what is the level of their participation with the local biodiversity strategy process and other local Government activities? Is more community participation needed and is there a role for the private sector?**

The AITG and Conservation Officers continue to be involved in monitoring and education as a result of funds raised on-island, additional funding acquired by the UK project team and as part of the Government initiative.

9. Monitoring and Evaluation, Lesson learning

- **Please explain your strategy for monitoring and evaluation (M&E) and give an outline of results. How does this demonstrate the value of the project? e.g. what baseline information was collected (e.g. scientific, social,**

economic), milestones in the project design, and indicators to identify your achievements (at purpose and goal level).

- **During the project period, has there been an internal or external evaluation of the work or are there any plans for this?**
- **What are the key lessons to be drawn from the experience of this project? We would welcome your comments on any broader lessons for Darwin Initiative as a programme or practical lessons that could be valuable to other projects, as we would like to present this information on a website page.**

Given that the project was essentially a training and scientific research exercise we did not feel the need to involve any other M&E other than the biannual reporting mechanism set up by Darwin and the associated agreed schedule of output and key milestones. This we did, meeting all milestones on or ahead of schedule and producing more than the agreed number of outputs. As scientists we feel that the acid test to the quality of our work is its passage through the peer-review process which has been accomplished 18 times to date on the project. We were aware that the Management Plan would be a highly used and cited document thus we subjected it to detailed peer review by a number of UK and international conservation specialists.

The main lesson from this project is that one cannot underestimate the value of community participation; even in a scientific research project. On Ascension Island with a large number of able-bodied trained volunteers and part-time Darwin Turtle Wardens we have achieved a fantastic amount. Whilst additional funding allowed monitoring to continue for a further 2 years now that this project is established and there are trained individuals on island we must aim to continue this project to maximise the investment.

10. Darwin Identity

- **What effort has the project made to publicise the Darwin Initiative, e.g. where did the project use the 'Darwin Initiative' logo, promote Darwin funding opportunities or projects? Was there evidence that Darwin Fellows or Darwin Scholars/Students used these titles?**

The Darwin Initiative has been acknowledged in all peer-reviewed publications resulting from this work. In addition the Darwin Logo has appeared on the front cover of the leaflet produced, the Management Plan, Video and on the First Day Cover of the set of stamps commemorating Ascension Island turtles. The logo has also been displayed on posters produced on Ascension Island, on scientific posters presented at conferences and when any slide shows or lectures are given relating to this work. In all related press articles the project has been referred to as the Darwin Initiative Turtle Project.

- **What is the understanding of Darwin Identity in the host country? Who, within the host country, is likely to be familiar with the Darwin Initiative and what evidence is there to show that people are aware of this project and the aims of the Darwin Initiative?**

Local Press articles refer to the Darwin Initiative Turtle Project and as the logo is

displayed on all educational material produced on Ascension Island the majority of Island residents is familiar with the Darwin Initiative.

- **Considering the project in the context of biodiversity conservation in the host country, did it form part of a larger programme that dwarfed Darwin funding or was it recognised as a distinct project with a clear identity?**

This project was titled the Darwin Initiative Turtle Project and was a distinct project that did not form a part of any larger programme.

11. Leverage

- **During the lifetime of the project, what additional funds were attracted to biodiversity work associated with the project, including additional investment by partners?**

A grant from the Foreign and Commonwealth Fund for the Overseas Territories for monitoring of the field seasons of 2000/2001 and 2001/2002 - £43,328

Waiving of annual per capita fee of £12,500 per island employee for 2000/2001 and 2001/2002 - £50,000

Additionally, >£50 000 of volunteer time, equipment and services were donated to the project.

- **What efforts were made by UK project staff to strengthen the capacity of partners to secure further funds for similar work in the host country and were attempts made to capture funds from international donors?**

The above funds were secured to enable a further two field seasons to be monitored. We aim to approach the FCO for funds to continue this monitoring at a reduced level in future years.

12. Sustainability and Legacy

- **What project achievements are most likely to endure? What will happen to project staff and resources after the project ends? Are partners likely to keep in touch?**

We hope that the AITG will continue to run Turtle Tours and the Conservation Centre indefinitely. Funds are being raised on island for this venture from tours, the sale of merchandise and donations. Basic monitoring will require further funds, which we aim to solicit and continue to support. Continued research interests will mean that the UK project team at the University of Wales Swansea will remain in touch and continue to give advice when requested.

- **Have the project's conclusions and outputs been widely applied? How could legacy have been improved?**

The only way the project's legacy could be improved is by ensuring that monitoring is now ongoing. We feel that the project's outputs have been well applied to date. Local government is now setting up legislation for protected status for the main nesting sites, genetic data obtained as part of a collaboration with University of Cardiff is feeding directly into the discussions between UK and Bonn Convention on Migratory Species as to the UK signing of a MoU for Marine turtles in West Africa.

- **Are additional funds being sought to continue aspects of the project (funds from where and for which aspects)?**

Yes, A grant from the Foreign and Commonwealth Fund for the Overseas Territories for monitoring of the field seasons of 2000/2001 and 2001/2002 (£43,328). Funds need to be secured for future field seasons.

13. Value for money

- **Considering the costs and benefits of the project, how do you rate the project in terms of value for money and what evidence do you have to support these conclusions?**

We are confident that this project can be considered as having been outstanding value for money on a number of levels as detailed in several places above.

1) Scientific outputs
2) Social Involvement in Monitoring and Research
3) Amount of in-kind funding and resources attracted
4) The legacy of ongoing monitoring and conservation work

Author(s) / Date

Drs Graeme Hays and Annette Broderick
1 May 2002

Appendix I: Project Contribution to Articles under the Convention on Biological Diversity (CBD)

Please complete the table below to show the extent of project contribution to the different measures for biodiversity conservation defined in the CBD Articles. This will enable us to tie Darwin projects more directly into CBD areas and to see if the underlying objective of the Darwin Initiative has been met. We have focused on CBD Articles that are most relevant to biodiversity conservation initiatives by small projects in developing countries. However, certain Articles have been omitted where they apply across the board. Where there is overlap between measures described by two different Articles, allocate the % to the most appropriate one.

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	**Project %**	**Article Description**
6. General Measures for Conservation & Sustainable Use		Develop national strategies which integrate conservation and sustainable use.
7. Identification and Monitoring	20	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities which have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	10	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation		Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	5	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures	5	Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	50	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries

		(in accordance with SBSTTA recommendations).
13. Public Education and Awareness	10	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology		Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information		Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Total %	**100%**	**Check % = total 100**

Appendix II Outputs

Please quantify and briefly describe all project outputs using the coding and format of the Darwin Initiative Standard Output Measures.

Code	Total to date (reduce box)	Detail (←expand box)
Training Outputs		
1a	Number of people to submit thesis PhD qualification	
1b	Number of PhD qualifications attained	
2	Number of Masters qualifications attained	
3	Number of other qualifications attained	
4a	Number of undergraduate students receiving training	
4b	Number of training weeks provided to undergraduate students	
4c	Number of postgraduate students receiving training (not 1-3 above)	3
4d	Number of training weeks for postgraduate students	20
5	Number of people receiving other forms of **long-term** (>1yr) training not leading to formal qualification(i.e not categories 1-4 above)	
6a	Number of people receiving other forms of **short-term** education/training (i.e not categories 1-5 above)	16
6b	Number of training weeks not leading to formal qualification	32
7	Number of types of training materials produced for use by host country(s)	2
Research Outputs		
8	Number of weeks spent by UK project staff on project work in host country(s)	104
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	1
10	Number of formal documents produced to assist work related to species identification, classification and recording.	
11a	Number of papers published or accepted for publication in peer reviewed journals	18
11b	Number of papers published or accepted for publication elsewhere	5
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	2
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	2
13a	Number of species reference collections established and handed over to host country(s)	
13b	Number of species reference collections enhanced	
Dissemination Outputs		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	2
14b	Numbers of conferences/seminars/workshops attended at which finding from Darwin project work have been presented/disseminated	3

Code	Total to date (reduce box)	Detail (←expand box)
15a	Number of national press releases or publicity articles in host country(s)	18
15b	Number of local press releases or publicity articles in host country(s)	As 15a
15c	Number of national press releases or publicity articles in UK	5
15d	Number of local press releases or publicity articles in UK	3
16a	Number of issues of newsletters produced in the host country(s)	
16b	Estimated circulation of each newsletter in the host country(s)	
16c	Estimated circulation of each newsletter in the UK	
17a	Number of dissemination networks established	1
17b	Number of dissemination networks enhanced/extended	
18a	Number of national TV programmes/features in host country(s)	
18b	Number of national TV programme/features in the UK	1
18c	Number of local TV programme/features in host country	
18d	Number of local TV programme features in the UK	1
19a	Number of national radio interviews/features in host country(s)	
19b	Number of national radio interviews/features in the UK	1
19c	Number of local radio interviews/features in host country (s)	There is no longer local radio on Ascension. To compensate public lectures and turtle watching tours have been organised on over 100 occasions with over 1000 participants.
19d	Number of local radio interviews/features in the UK	2
Physical Outputs		
20	Estimated value (£s) of physical assets handed over to host country(s)	
21	Number of permanent educational/training/research facilities or organisation established	1
22	Number of permanent field plots established	30
23	Value of additional resources raised for project	

OUPTUTS (* denotes included as hard copies)

Peer-reviewed papers (all included as hard copies)

1. Akesson, S., Luschi, P., Papi, F., Broderick, A.C., Glen, F., Godley, B.J., Hays, G.C. 2001. Oceanic Long-distance Navigation: Do experienced migrants use the earth's magnetic field? Journal of Navigation 27: 419-427.
2. Broderick, A.C., Godley, B.J., Hays G.C. 2001. Metabolic Heating and the Prediction of Sex Ratios for Green Turtles (*Chelonia mydas*). Physiological and Biochemical Zoology 74: 161-170
3. Broderick, A.C., Godley, B.J., Hays, G.C. 2001. Trophic status drives inter-annual variability in nesting numbers of marine turtles. Proceedings of the Royal Society of London B. 268:1481-1487
4. Godley, B.J. Broderick, A.C., Hays, G.C. 2001. Nesting of green turtles (*Chelonia mydas*) at Ascension Island, South Atlantic. Biological Conservation 97: 151-158.
5. Godley, B.J., Broderick, A.C., Glen, F., Hays, G.C. 2002. Temperature dependent sex determination of Ascension Island green turtles. Marine Ecology Progress Series 226:115-124
6. Godley, B.J., Broderick, A.C., Frauenstein, R., Glen, F., Hays, G.C. 2002. Reproductive seasonality and sexual dimorphism in green turtles. Marine Ecology Progress Series 226: 125-133
7. Hays, G.C. 2000. The implications of variable remigration intervals for the assessment of population size in marine turtles. Journal of Theoretical Biology 206: 221-227.
8. Hays, G.C., Godley, B.J., Broderick, A.C. 1999. Long-term thermal conditions on the nesting beaches of green turtles on Ascension Island Marine Ecology Progress Series 185:297-299.
9. Hays, G.C., Luschi, P., Papi, F., Del Seppia, C., Marsh, R. 1999. Changes in behaviour during the inter-nesting period and post-nesting migration for Ascension Island green turtles. Marine Ecology Progress Series 189, 263-273.
10. Hays, G.C., Adams, C.R., Broderick, A.C., Godley, B.J., Lucas, D.J., Metcalfe, J.D., Prior, A.A. 2000. The diving behaviour of green turtles at Ascension Island. Animal Behaviour 59: 577-586.
11. Hays, G.C., Åkesson, S., Godley, B.J., Luschi, P., Santidrian, P. 2001. The implications of location accuracy for the interpretation of satellite tracking data. Animal Behaviour 61: 1035-1040
12. Hays, G.C., Godley, B.J., Broderick, A.C., Glen, F., Nicholls, W.J. 2001. The movements and submergence behaviour of male green turtles at Ascension Island. Marine Biology 139: 395-399.
13. Hays, G.C., Ashworth, J.S., Barnsley, M.J., Broderick, A.C., Emery, D.R., Godley, B.J., Henwood, A., Jones, E.L. 2001. The importance of sand albedo for the thermal conditions on sea turtle nesting beaches. Oikos 93: 87-95
14. Hays, G.C., Dray, M., Quaife, T., Smyth, T., Mironnet, N.C., Papi, F., Luschi, P., Barnsley, M.J. 2001. Movements of migrating green turtles in relation to AVHRR derived sea surface temperature. International Journal of Remote Sensing 22: 1403-1411.
15. Hays, G.C., Akesson, S., Broderick, A.C., Glen, F., Godley, B.J., Luschi, P., Martin, C., Metcalfe, J.D., Papi, F. 2001. The diving behaviour of green turtles undertaking oceanic migration to and from Ascension Island: dive durations, dive profiles and depth distribution. The Journal of Experimental Biology 204: 4093-4098.
16. Luschi, P., Hays, G.C., Del Seppia, C., Marsh, R., Papi, F. 1998. The navigational feats of green sea turtles migrating from Ascension Island investigated by satellite telemetry. Proceedings Royal Society London B. 265: 2279-2284

17. Luschi, P., Akesson, S., Broderick, A.C., Glen, F., Godley, B.J., Papi, F., Hays, G. 2001. Testing the navigational abilities of ocean migrants: displacement experiments on green sea turtles (*Chelonia mydas*). Behavioural Ecology and Sociobiology 50: 528-534.
18. Papi, F., Luschi, P., Akesson, S., Capogrossi, S., Hays, G.C. 2000. Open-sea migration of magnetically disturbed sea turtles. Journal of Experimental Biology 203:3435-3443

Local press articles on Ascension Island:

12th November 1998: 1st newspaper article on Ascension.
"*Launch of major marine turtle project on Ascension*"

17th December 1998: 2nd newspaper article on Ascension.
"*Ascension marine turtle project underway*"

14th January 1999: 3rd newspaper article on Ascension.
"*Turtle project continues to progress* "

18th February 1999: 4th newspaper article on Ascension.
"*Scouts/Cubs weekend camp*"

18th February 1999: 5th newspaper article on Ascension.
"*Recent activities of Darwin Initiative Turtle Project*"

8th April 1999: 6th newspaper article on Ascension.
"*Further activities of Darwin Initiative Turtle Project*"

22nd April 1999: 7th newspaper article on Ascension.
"*Possible threat to marine life: a call for assistance*"

2nd December 1999: 8th Newspaper article on Ascension
"*Darwin Initiative Turtle Project Set for 1999/2000 Season.*"

9th December 1999: 9th Newspaper article on Ascension
"*Darwin Turtle Project Update: Season Off to a Slow Start."*

23rd March 2000: 10th Newspaper article on Ascension
"*Recent Activities of Darwin Initiative Turtle Project."*

28th September 2000 11th Newspaper article on Ascension
"Ascension Turtle Project to Continue!"

21st December 2000 12th Newspaper article on Ascension
"Turtle Project: A Call to Get Involved"

7th January 2001 13th Newspaper article on Ascension
"Turtle Update: 7th January 2001"

24th May 2001 14th Newspaper article on Ascension
'Another Successful Season'

2nd January 2002 15th Newspaper article on Ascension
'Turtle Project Enters its 4th Successive Year'

9th January 2002 16th Newspaper article on Ascension.

'*Closure of Long Beach Road at Night: An Appeal for Co-operation'*

30th January 2002 17th Newspaper article on Ascension
'Marine Turtle News'

21st March 2002 18th Newspaper article on Ascension
'Diving Behaviour of sea turtles'

UK Press articles

12th March 1999 Radio Interview BBC World Service

31st March 1999 'The Long-Distance Turtles' The Times Newspaper

April 2000 Press release for launch of turtle stamps resulting in TV report featured on BBC Wales Evening News and articles in the South Wales Evening Post and the Times Higher Education Supplement.

6th December 2000 Radio Interview – South Wales Sound

Presentations at Symposia/Lectures given

Annette C. Broderick, Brendan J. Godley, Graeme C. Hays (2000). Metabolic heating of marine turtle eggs and the prediction of sex ratios. School of Biological Sciences Symposium, University of Wales Swansea

Annette C. Broderick, Robert Frauenstein, Fiona Glen, Brendan J. Godley, Graeme C. Hays (2001) Status of Green Turtles Nesting on Ascension: Looking to the Future. Presented at the *21st Annual Sea Turtle Symposium on Sea Turtle Biology and Conservation, Philadelphia March 2001*

Brendan J. Godley, Annette C. Broderick, Robert Frauenstein, Fiona Glen, Graeme C. Hays (2000). Mating behaviour and male movements of Ascension Island green turtles. School of Biological Sciences Symposium, University of Wales Swansea

Brendan J. Godley, Annette C. Broderick, Robert Frauenstein, Fiona Glen, Graeme C. Hays. (2001). Reproductive Seasonality and Reverse Sexual Dimorphism in Green Turtles. Presented at the *21st Annual Sea Turtle Symposium on Sea Turtle Biology and Conservation, Philadelphia March 2001*

Brendan Godley. (2001) Marine Turtle Research at the University of Wales Swansea. Institute of Biology, Mid Wales Branch, Aberystwyth.

Brendan Godley. (2001). Biology of Marine Turtles at Ascension Island. Guest Lecture, University of Cork, Ireland

Graeme C. Hays. (2001). Adaptations to food limitation during nesting and migration. The First Mediterranean Conference on Marine Turtles. Rome 24-28 October 2001. *INVITED KEYNOTE SPEAKER*:

Graeme C. Hays. (2001). "Tracking trans-oceanic migrations by turtles." University of Wales, Cardiff, School of Biosciences. Guest Lecture.

Graeme C. Hays. (2000). "Migration and diving in marine turtles". Dunstaffnage Marine Laboratory. *New Directions in Marine Science Symposium*. Guest Lecture.

Graeme C. Hays. (2000). “Diving in marine turtles”. University of Oxford, Department of Zoology. Guest Lecture.

Graeme C. Hays. (1999). “The diving behaviour of green turtles at Ascension Island”. The Centre for Environment, Fisheries & Aquaculture Science (CEFAS formerly MAFF). Guest Lecture.

Graeme C. Hays. (1998). “Satellite tracking the trans-oceanic migrations of marine turtles.” University of Oxford, Department of Zoology. Guest Lecture.

Training Materials

* Broderick, A.C. Godley, B.J. & Hays, G.C. 1998. Biology and Conservation of Marine Turtles – Course notes

* Broderick, A.C. Ascension’s Sea Turtles – Slide Show

Additional Outputs:

Management Plan
* Broderick, AC, Glen, F, Godley, B.J. & Hays, G.C. (2002) A Management Pan for the Marine Turtles of Ascension Island. Marie Turtle Research Group, University of Wales

Educational Video
* A video has been produced for use in the Conservation Centre. Copies are available from the UK project team.

Educational Leaflet
* A detailed leaflet has been produced providing background, biology and guidelines for watching turtles on Ascension. In addition posters were also distributed summarising this information.

Commemorative Stamps
* A set of stamps have been produced to commemorate the research into marine turtles of Ascension Island. This included a set of four stamps and a souvenir sheet featuring artwork by the pupils of Two Boats School. All items can be viewed at <http://www.ascension-island.gov.ac/ascstamps>. The Darwin logo is prominently placed. In addition the release was announced in the internationally distributed *Marine Turtle Newsletter* (Broderick, A.C. & Godley B.J. 2000. Stamps to Celebrate Marine Turtle Research on Ascension Island. Marine Turtle Newsletter 88:18)

Web site
Darwin Initiative Turtle Project web site is located at:
<http://www.seaturtle.org/mtrg/projects/ascension/>

Historical Overview of Turtle Exploitation
Support was given in the production of: Huxley, R. 1999. Historical overview of marine turtle exploitation, Ascension Island, South Atlantic. *Marine Turtle Newsletter* 84:7-9

Natural History Film making
28th February-6th March 1999, Darwin Team assisted BBC film crew on the island to film the turtles as part of the major series ‘Blue Planet’ and received acknowledgement in credits.

Appendix III: Publications

Provide full details of all publications and material 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, CD)*	***Detail*** *(title, author, year)*	***Publishers*** *(name, city)*	***Available from***	**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* **03**: 3435-3443	*n/a*	*n/a*
*Journal**	Nesting of green turtles *Chelonia mydas* 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. (2001)	*International Journal of Remote Sensing*. **22**:1403-1411	*n/a*	*n/a*

*Journal**	Metabolic heating and the prediction of sex ratios for green turtles (*Chelonia mydas*). 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 (2001)	*Oikos* **93**:87-95	*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 (2001).	*Marine Biology* **139**:395-399	*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 (2001)	*Animal Behaviour* **61**:1035-1040	*n/a*	*n/a*
*Journal**	Trophic status drives inter-annual variability in nesting numbers of marine turtles. Broderick AC, Godley BJ, Hays GC (2001).	*Proceedings of the Royal Society of London B* **268**: 1481-1487	*n/a*	*n/a*
*Journal**	Oceanic Long-distance Navigation: Do experienced migrants use the earth's magnetic field? Akesson, S., Luschi, P., Papi, F., Broderick, A.C., Glen, F., Godley, B.J., Hays, G.C. (2001).	*Journal of Navigation* **27:** 419-427.	*n/a*	*n/a*
*Journal**	The diving behaviour of green turtles undertaking oceanic migration to and from Ascension Island: dive durations, dive profiles and depth distribution. Hays, G.C., Akesson, S., Broderick, A.C., Glen, F., Godley, B.J., Luschi, P., Martin, C., Metcalfe, J.D., Papi, F. (2001).	*The Journal of Experimental Biology* **204**: 4093-4098.	*n/a*	*n/a*
*Journal**	Testing the navigational abilities of ocean migrants: displacement experiments on green sea turtles (*Chelonia mydas*). Luschi, P., Akesson, S., Broderick, A.C., Glen, F., Godley, B.J., Papi, F., Hays, G. (2001).	*Behavioural Ecology and Sociobiology* **50**: 528-534.	*n/a*	*n/a*
*Journal**	Reproductive seasonality and sexual dimorphism in green turtles. Godley, B.J., Broderick, A.C., Frauenstein, R., Glen, F., Hays, G.C. (2002).	*Marine Ecology Progress Series* **226**: 125-133	*n/a*	*n/a*

*Journal**	Temperature dependent sex determination of Ascension Island green turtles. Godley, B.J., Broderick, A.C., Glen, F., Hays, G.C. (2002).	*Marine Ecology Progress Series* **226**:115-124	*N/a*	*n/a*
Video	Marine Turtles of Ascension Island	*Marine Turtle Research Group*	*University of Wales Swansea*	*£10*
*Management Plan**	*A Management Pan for the Marine Turtles of Ascension Island Broderick, AC, Glen, F, Godley, B.J. & Hays, G.C. (2002)*	*Marine Turtle Research Group*	*<http://www.seaturtle.org/mtrg>*	*n/a*

Appendix IV: Darwin Contacts

To assist us with future evaluation work and feedback on your report , please provide contact details below.

Project Title	Assessing the Status of Ascension Island Turtles
Ref. No.	**162/7/006**
UK Leader Details	
Name	Dr Graeme C. Hays
Role within Darwin Project	Project Leader
Address	School of Biological Sciences, University of Wales Swansea, SA2 8PP, UK
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	Dr Annette C. Broderick
Role within Darwin Project	Project Officer
Address	School of Biological Sciences, University of Wales Swansea, SA2 8PP, UK
Phone	
Fax	
Email	
Partner 1	
Name	Geoffrey Fairhurst
Organisation	Ascension Island Administrator, FCO
Role within Darwin Project	Collaborator
Address	Administrator, Ascension Island, South Atlantic
Fax	
Email	
Partner 2 (if relevant)	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax	
Email	