

**DARWIN INITIATIVE FOR THE SURVIVAL OF SPECIES : APPLICATION FOR GRANT FOR ROUND 9
COMPETITION**

Please read the accompanying Guidance Note before completing this form. Give a full answer to each section; applications will be considered on the basis of information submitted on this form. Applicants are asked not to use the form supplied to cross refer to information in separate documents except where this is invited on the form. The space provided indicates the level of detail required but you may provide additional information on a separate sheet if necessary. Copies of this form are available on disk or by e-mail on request. You are asked also to complete the summary sheet attached at the end of this form. Although you may reproduce this sheet in a reasonable font, you should not expand it beyond an A4 sheet (leaving the allocated space for DETR comments to be made) as additional information will not be taken into account.

1. Name and address of organisation

DIVISION OF ENVIRONMENTAL & EVOLUTIONARY BIOLOGY, INSTITUTE OF BIOMEDICAL & LIFE SCIENCES,
GRAHAM KERR BUILDING, UNIVERSITY OF GLASGOW, GLASGOW G12 8QQ

2. Principals in project

Details	Project leader	Other UK personnel (if working more than 50% on project)	Main project partner or co-ordinator in host country
Surname	Downie	Livingstone	Salvary
Forename(s)	John Roger	Suzanne R.	Dominic
Post held	Senior Lecturer (Zoology) Head of Division	Employed on project	Part-time worker, Trinidad Ministry of Health
Institution (if different to the above)			
Department			
Telephone			
Fax			
Email			

Please provide a one page CV for each of these named individuals.

3. Project title (not exceeding 10 words)

MARINE TURTLE CONSERVATION AND ECOTOURISM ON TRINIDAD'S NORTH COAST

4. Abstract of study (in no more than 750 characters)

Trinidad's north coast is sparsely populated, related to the lack of a through road. Several beaches along this coast support nesting of endangered marine turtles: leatherbacks, hawksbills, greens, loggerheads and olive ridleys. However, numbers and nesting success are poorly known, compared to well-established data from the east coast. The project aims to study the breeding biology and conservation problems of the north coast beaches and to investigate the ecotourism potential of this remote area. Our hypothesis is that small ecotourist groups, gaining access to the beaches by boat, sailed by trained local guides, will be able to collect valuable data on nesting turtles and, by their presence, deter poaching. The adventurous nature of the experience will attract tourists keen on protecting biodiversity.

5. Timing. Give the proposed starting date and duration of the project.

Start: March 1st, 2002 (the nesting season is late March to September). Duration: two years.

6. Describe briefly the aims, activities and achievements of your organisation. (Please note that this should describe your unit, institute or department within a university.)

Aims

The mission of the University of Glasgow is to be a major research-led university operating in an international context with the following fundamental aims: i) to provide education through the development of learning in a research environment; ii) to undertake fundamental, strategic and applied research; iii) to sustain and add value to Scottish and international culture, to the natural environment and to the national economy. The University undertakes the full range of academic activities in meeting these aims, through undergraduate, postgraduate and vocation teaching and training, basic, strategic and applied research. This mission applies in full to the Division of Environmental and Evolutionary Biology of the Institute of Biomedical & Life Sciences (IBLS-DEEB).

Activities

IBLS is one of 11 Faculties of the University of Glasgow, and DEEB is one of the major research units of IBLS, with 23 academic staff, 22 postdoctoral research fellows/ research assistants and 54 postgraduate researchers. DEEB has four main research themes: aquatic ecology and eco-physiology; freshwater fish biology; biodiversity and systematics; and applied ornithology. In the context of the proposed study, a large number of externally-funded research investigations have been undertaken by DEEB staff both in the UK and internationally: in fish biology, aquatic ecology and biodiversity studies.

DEEB obtains major research council funding from NERC and BBSRC, and also from other agencies such as the EC, SNH and conservation charities such as RSPB. This application arises from a staff-student enterprise, the organisation of overseas expeditions. Since 1989, DEEB staff have accompanied students on 8 expeditions to Trinidad to work on a wide range of biological and conservation problems, including marine turtles. Marine turtles have also been the focus of nearly 10 expeditions to Cyprus. These expeditions are part-funded by students' efforts and part by agencies such as the Carnegie Trust, Royal Geographical Society, Royal Scottish Geographical Society, Albert Reckitt Trust, British Ecological Society, etc. Additional research funding has been obtained for the work in Trinidad via the British Council and a NERC studentship.

Achievements

DEEB's output of research papers, reports and books is very extensive, covering the whole spectrum of issues relating to Environmental and Evolutionary Biology.

In the context of the application, three research students have obtained Ph.Ds as a result of work on marine turtles, supervised by DEEB staff. Many more undergraduate projects have been completed in this field and together this work has generated around 20 publications in refereed journals. The project leader is co-author of four of these.

The project leader's publications from his work in Trinidad have mainly focussed on amphibian biology. A significant part of his research output has also been on education, including the involvement of NGO's in environmental education, a relevant factor in this application.

The project leader is the founder and current chair of the University of Glasgow's Exploration Society. This is one of the most successful such organisations in the UK, facilitating expeditions abroad which involve as many as 100 staff and students each year, each Expedition generating a final report and many producing work that has later been published in refereed journals.

7. Has your organisation received funding under the Initiative before? If so, please give details.

No: although we have made several applications.

8. Which overseas institutions, if any, will be involved in the project? Please explain the responsibilities of these institutions.

- The project will primarily involve **two local non-governmental community groups:**
Grande Riviere Environmental Awareness Trust (GREAT) - based in the village of Grande Riviere.
Pawi, Turtle Protector and Eco Club (PATPEC) - based in the village of Matelot.
Both groups have been involved in monitoring turtle nesting locally for some years, and to a small extent in ecotourism.
The project's host country co-ordinator, Dominic Salvary, acts as liaison officer for the two groups.
Both groups will supply local guides with a good knowledge of the north coast and its biodiversity, and with potential for training to make them more effective as ecotourist guides.
- Members of Trinidad's conservation community have acted and will continue to act as **advisers** to the project notably:
Nadra Gyan, Head of the Wildlife Section, Forestry Division, Ministry of Agriculture, Land and Marine Resources.
Howard Nelson, Environmental Management Authority: responsible for enactment of the Trinidad Government's Biodiversity Strategy and Action Plan.
Professor Peter Bacon, Head of Zoology, University of the West Indies, St Augustine, Trinidad. Established authority on marine turtles in the Caribbean.
Dennis Sammy of 'Nature Seekers', turtle conservation group at Matura.
- Louis Bertrand of the Association for Caribbean Transformation (ACT) will advise on the community development and market research aspects of the project. Opio Morani of the Social Workers Association of Trinidad & Tobago (SWATT) will also advise on community development.

PROJECT DETAILS

9. Define the purpose (main objective) of the project in line with the logical framework.

Background

All seven generally recognised species of marine turtles are currently classed by IUCN as endangered or threatened. Of these species, five (leatherbacks, hawksbills, greens, olive ridleys and loggerheads) are known to nest on the beaches of Trinidad. Recent reports from around the world indicate serious long term declines in numbers of some turtle species, while others are more encouraging^{1,2}. In Trinidad, there is good evidence of a recent increase in nesting of leatherbacks including an extension of east coast nesting to Manzanilla, but declines in numbers of other species.

Since 1990, a Trinidad-based NGO "Nature Seekers" has provided a beach patrol, data collection and visitor guiding scheme at the important east coast beach of Matura. For the last three years this has included a turtle-tagging programme. A smaller-scale scheme also exists at Fishing Pond (east) and Grande Riviere (north-east). These schemes have greatly reduced turtle poaching and may be related to the increased numbers of nesting leatherbacks.

Trinidad's north-coast has a series of relatively inaccessible beaches where turtles also nest: Paria, Murphy's, Madamas, Petite and Grande Tacaribe. These extend over approximately 22 km of coast and are inaccessible because of the lack of a metalled road between Blanchisseuse (west) and Matelot (east): they can, however, be accessed by small boat (there are no piers or landing stages). A preliminary survey by members of the University of Glasgow Trinidad 2000 expedition found an average of 130 leatherback nests per day laid on the north coast, representing a turtle population of 2600, around 2.5% of the world female population. Very small numbers of other species were detected, however. This area is clearly significant for leatherbacks, in the context of serious declines elsewhere!

At Matura, "Nature Seekers" has become an excellent, internationally recognised, example of wildlife conservation related to community development. The conservation/guiding scheme has become a source of self-education for the local people, and also a source of income and employment. It has become more difficult to develop a similar scheme on the North Coast because of the relative remoteness of the area and the poor infrastructure (visitors can reach Matura by road from Port of Spain in 1.5-2h; it takes a further 2h to reach Grande Riviere). However, there are now a number of small hotels/guest houses being built, or already in existence, in the Toco - Grande Riviere region, so there is now the opportunity for visitors to lodge in the area.

Main objectives

- To investigate the nesting biology of marine turtles on the north coast of Trinidad. Because of the area's inaccessibility, a detailed survey has never been carried out. This is a serious lack for such an important group as marine turtles in such a key part of their range. Our preliminary work (University of Glasgow Expedition, 2000) has established that numbers of nesting turtles on these beaches are a significant part of the total population. Factors to be investigated in depth include hatching success, predation levels, nest infestation by parasites, the effects of sand erosion, temperature and sex ratio, and the nesting frequency of the population.
- To establish and trial a visitor-guiding scheme on the remote north coast beaches: visitors will be taken by boat, and will be trained to participate in turtle monitoring.

Subsidiary objective

- To undertake a public education programme on turtles and the need for their conservation. We will target young children and their parents. Our preliminary work (University of Glasgow Expedition, 2000) trialed innovative educational methods with a group of local children, and we will follow this up.
1. Spotila (2000) Pacific leatherback turtles face extinction. *Nature* 405, 529.
 2. Bjorndal (1999) Twenty six years of green turtle nesting at Tortuguero, Costa Rica: an encouraging trend. *Conservation Biology* 13, 126-34.

10. Is this a new project or the continuation of an existing one?

The project is new in detail, but is a logical follow-up to a preliminary investigation which formed part of the University of Glasgow Trinidad Expedition in 2000, and to earlier expedition experience in 1989 and 1991.

11. What is the evidence for a demand or need for the work? How is the project related to conservation priorities in the host country(ies)? How would the project assist the host country with its obligations under the Biodiversity Convention?

How was the work identified?

When planning an expedition to Trinidad, Glasgow University staff were contacted by a group in Trinidad who needed help with turtle conservation. Staff and students of the University of Glasgow Trinidad 2000 Expedition then worked closely with members of the recently-formed NGO, PATPEC, at Matelot on the north coast of Trinidad, and with their support group. The work involved north coast beach patrols to monitor nesting and hatching turtles, and also discussions on how to develop the NGO. This included the drafting of a small grant application to a locally-based award scheme funded by BP Amoco.

How is the project related to conservation priorities in the host country?

The Government of Trinidad & Tobago established its Environmental Management Authority (EMA) in 1995, to co-ordinate the national environmental strategy; the Government ratified the Convention on Biodiversity in 1996 and set the EMA the task of formulating a National Biodiversity Strategy and Action Plan. The Strategy is still in draft form, but monitoring and conservation of marine turtles has long had a high priority, dating back to the establishment of "Nature Seekers" in 1990, set up at the instigation of the Ministry of Agriculture, Land and Marine Resources's Wildlife Section.

It is also an objective of the Trinidad Government to promote ecotourism in such a way that the income generated will assist biodiversity conservation.

How will the project assist the host country meet its obligations under the Biodiversity Convention?

An objective of the project is the establishment of a sustainable and well-trained NGO whose activities will help conserve the turtle nesting beaches of the north coast. Given the endangered status of marine turtles, this is an important aspect of Trinidad's Biodiversity Convention obligations. (see Mrs. Gyan's letter of support).

12. In what ways can this project be considered a Darwin project? How does the project relate to the Darwin principles? How would the project be advertised as a Darwin project and in what ways would the Darwin name and logo be used?

Trinidad is rich in biodiversity: it is an island of less than 5000 km², but houses over 2000 species of flowering plants, 420 species of birds etc. Endemism is not particularly high because of the close relationship between Trinidad and mainland Venezuela.

Trinidad is not one of the poorer Caribbean countries, but it does lack the resources to conserve its abundant biological diversity effectively. The rich diversity of species and habitats, and relatively poor infrastructure (roads in particular) make the task of conservation especially difficult. Because the project aims to meet an important conservation of biodiversity objective, by means of a scheme which will not require public funds, it is particularly suited to Trinidad's needs.

The small communities of Trinidad's north coast have not benefitted from the country's oil income, and are amongst the island's poorest, subsisting on small-scale fishing and gardening. The project, by providing a sustainable income-generating scheme, meets the Darwin objective of poverty elimination.

The project is directed by Dr J.R. Downie who has several years experience of turtle conservation work in Trinidad and Cyprus, including the supervision of a graduate thesis and several undergraduate projects. Several scientific papers in refereed journals have resulted from this work (see his c.v.). The researcher, Ms Suzanne Livingstone, is a Zoology graduate with experience of turtle monitoring work in Cyprus and Trinidad. She is currently undertaking an M.Res. course at the University of Edinburgh, which will upgrade her skills in several areas relevant to this project. The project therefore uses British expertise of high scientific quality.

This application is one of several targetted to different agencies (International Fund for Animal Welfare; United Nations Development Fund) and aimed at different aspects of the project. The Darwin application is seen as a key catalyst of the operation as a whole. A small grant has recently been obtained by the NGO PATPEC from the UNDP, and a donation of re-conditioned computing equipment will reach PATPEC soon.

We will use the Darwin name and logo in all publicity and literature related to the project including its web-site. There is considerable media interest in turtles in Trinidad - Our 2000 Expedition has already been reported in the Trinidad national press.

The project will provide extremely good value for money, because the number of personnel working on the project will be greatly augmented by volunteers, UK biological sciences students whose participation will be self-funded as part of University of Glasgow expeditions and who will provide much of the workforce needed for the time-consuming turtle monitoring. We will also recruit volunteers from the University of the West Indies.

13. Set out the proposed timetable for the work, including the programme's measurable outputs using the attached list of output measures.

March 2002 Project leader and researcher prepare training scheme for use with Trinidad NGOs.

April 2002: Researcher plus team of three volunteers arrive in Trinidad to a) implement training scheme with NGO members at Matelot and Grande Riviere b) start north coast beach monitoring programme (turtle species and numbers; nest temperature monitoring; assessment of predation and other threats).

July 2002: Project leader and fresh UK volunteer team arrive in Trinidad to

- a) continue beach monitoring programme till the end of the season (September).
- b) assess the success of training scheme.
- c) design and take part in outreach educational scheme with Trinidadian children's groups (summer camps) aimed at raising awareness of biodiversity in general and marine turtles in particular.
- d) discuss details of the second season, especially the involvement of a test ecotourist population.

September 2002: Project team returns to UK. Researcher analyses data from first field season, including questionnaire based on training and outreach work. Writes promotional material for ecotourism scheme. Sets up project web-site.

March 2003: Researcher plus volunteer team arrive in Trinidad for second field season. They a) provide follow-up training, according to identified needs, to NGO members b) begin second season of beach monitoring c) recruit ecotourist population to take part in trial visitor experience (arrival at remote beaches by boat; tented accommodation; on-site turtle training; beach-monitoring). The trial population will be drawn from Trinidad, or visitors at local guest-houses, according to availability. The promotional material (above) will have raised awareness of this opportunity. The text will be disseminated as hard copy and also via the web-sites of ecotourist guest houses that have them.

July 2003: Project leader and fresh UK volunteer team arrive in Trinidad. Continue beach monitoring. Repeat outreach scheme. Assess success of pilot ecotourist experience.

September 2003: Project team presents preliminary report on the project to a seminar for stakeholders (NGOs; Trinidad conservation groups; relevant Government agencies).

Project team then returns to UK. Researcher analyses second set of beach monitoring data. Analyses data from training, outreach and ecotourism questionnaires. Prepares final report.

March 2004

Project ends with publication of final report and submission of papers to refereed journals.

Measurable outputs

- 4AB In each year, 5 UK undergraduates to receive 8 weeks training in turtle monitoring. A similar number of
- 6AB Trinidad students will be trained in turtle monitoring and basic biology.
Members of NGOs at Matelot (PATPEC) and Grande Riviere (GREAT) to receive training in turtle biology and ecotourist handling. We will train around 20 guides; the training will involve a week's formal work with a follow-up of 8-12 weeks work experience including continuous feedback on performance..
- 7 Training materials will include a slide pack and booklet on turtle biology; also a set of simulation exercises on ecotourist handling.
- 8 Researcher to spend 50 weeks in host country; Project leader to spend 10 weeks in host country.
- 9 Final report to include recommendations on turtle management on Trinidad's north coast.
- 11b Papers (at least 3) on
- Turtle monitoring data
 - Experience of the ecotourism project
 - Outreach work with children
- 14B One seminar in host country on conclusion of fieldwork. We will discuss with the Trinidad Government the organisation of a later seminar, once the project is complete, but have not budgeted for this.
- 15A We will contact the Trinidad media regularly on the progress of the work. We already have press contacts who have shown an interest and written on our preliminary work. (Trinidad has two main newspapers, plus several television channels). We will discuss with Trinidad national TV the production of a programme on the project (18A).
- 20 The two lap-top computers and the vehicle purchased for the project will be donated to the local NGOs at the end of the project.
- 23 We estimate that costs of UK volunteers, raised by their own efforts, will be in the order of £625 each i.e. for 16 volunteers, £10,000.

14. Do you know of any other individual/organisation carrying out similar work? Give the details of the work, explaining the similarities and differences.

The Universities Turtle Conservation Expedition (formerly based in Glasgow, but now organised through the Marine Turtle Research Group at the University of Swansea, web-site: <http://www.seaturtle.org/mtrg/>) has collected nesting data annually since 1992, by means of volunteer student groups. They have also undertaken a public education programme which aims at local people and tourists. However, economic conditions in Cyprus are very different from Trinidad, and it is very unlikely that an income-generating guiding service could be set up there. Earthwatch also organises turtle monitoring using paying volunteers, but their scheme does not, to our knowledge, promote local community development.

15. Will the project include training and development? Please indicate how many trainees will be involved, from which countries and what will be the criteria for selection. How will you measure the effectiveness of the training and will those trained then be able to train others? Where appropriate give the length of any training course.

As outlined above, training is crucial to this project. Training in turtle monitoring and ecotourist guiding will be provided for 20 existing members of PATPEC and GREAT who already have good knowledge of the wildlife of the area and who show potential for work with ecotourists. Over the two years of the project, we will identify members of the groups who will be able to carry on this training into the future, making it sustainable.

- Training in turtle nesting data collection and monitoring will also be provided for two groups of five University of Glasgow undergraduates, and for similar groups of University of the West Indies students.
- An aim of the project is that ecotourists will receive a short course, from the guides, on turtle monitoring, allowing them to be useful on beach patrols.

Effectiveness of training will be judged by the project's researcher, by assessment of the practical performance of the trainees. Regular feedback based on performance will aim for continuous improvement.

16. How will trainee outcomes/destinations be monitored after the end of the training?

Performance of trained guides will be monitored by the project team, during the latter stages of the project. Later, the leaders of the two NGOs will be responsible for training and monitoring.

The learning achieved by UK University students will form an informal part of their degree studies. Experience tells us that overseas experience of this kind has a very valuable motivating effect on students.

The learning experienced by ecotourists will be assessed by questionnaire and interview, as part of our research into the effectiveness of our ecotourism scheme. The NGOs will be encouraged to continue the use of such an assessment as part of their quality monitoring system.

17. How is the work of the project expected to continue after the end of grant period? A clear exit strategy must be included.

It is a key aim of the project to create a self-sustaining turtle monitoring/ecotourism scheme. If this is fully successful, the programme should continue without need for extra funding. It is likely, however, that extra funds may be needed for infrastructural improvements - new boats; shelters at the beaches. We consider that once the success of the basic scheme has been demonstrated, the NGO's will be in a favourable position to apply for specific funding from international development agencies, and possibly from local companies. We are already aware of possible small-scale support from a local hotel owner.

It will be important for the two NGOs to establish a business plan for the long-term development of the scheme. The principals in this project do not have the relevant expertise but members of our Trinidad advisory group, especially Louis Bertrand and Opio Morani, do. Once the project has been funded, they will arrange a small business training programme.

MONITORING AND EVALUATION

18. Describe how progress on the project would be monitored and evaluated in terms of achieving its aims and objectives, both during the lifetime of the project and at its conclusion. How would you ensure that it achieves value for money? What arrangements will be made for disseminating results? If applicable, how would you seek the views of clients/customers?

The monitoring and evaluation process has been summarised in the project timetable. The success of the training element will be assessed by interview and questionnaire during the project, and the results used to modify, as needed, details of the training programme. Results of the turtle monitoring and the educational aspects of the project will be written up for journal publication, and the project's final report. We will organise two seminars for stakeholders in Trinidad, and will arrange additional funding from the Trinidad Government for the second one, some time after completion of the field and data collection parts of the project.

19. Logical framework. Please enter the details of your project onto the matrix using the note at Annex B of the Guidance Note.

Project summary	Measurable indicators	Means of verification	Important assumptions
<p>Goal To assist Trinidad to monitor and conserve its north coast marine turtle resources by designing a financially sustainable ecotourism programme, benefitting low-income groups in Trinidad.</p>	Sustainability of the scheme once established.	Numbers of ecotourists; income generated (source-accounts of both NGOs)	Continued commitment of Trinidad Government to turtle conservation, with north coast remaining an area not served by a metalled through road.
<p>Purpose Establishment of a sustainable turtle conservation programme, linked to ecotourism.</p>	Effects on local people; effects on north coast turtle populations; impact on tourists.	Numbers of ecotourists; income generated (source-accounts of both NGOs)	Continued interest of members of local NGOs in ecotourism: for example, new sources of local employment could be a distorting factor; or any source of adverse publicity affecting visitor numbers in Trinidad.
<p>Outputs</p> <ul style="list-style-type: none"> • training of local people in turtle biology and ecotourism guiding. • Training of students in turtle monitoring. • Research reports that will highlight results both of turtle monitoring and of the innovative ecotourism scheme. 	Records and evaluation of training; submission of research reports.	Databank of records maintained by the NGOs; Research journals.	Most local people have received little formal education: it is a basic assumption that we can devise a training programme suitable for their needs.
<p>Activities</p> <p>Training workshops; beach patrols; educational work with tourists, local people and students; report writing</p>	Activities undertaken on schedule and to planned specifications.	Project reports and feedback to DETR; papers published in scientific journals.	We propose to pilot our ecotourism scheme on students, but are keen to test it on 'real' tourists. An assumption therefore, is that there will be a willing tourist population. Since tourism is still a small sector of the Trinidad economy, this cannot be guaranteed.