Submit by 21 January 2005 14-054

DARWIN INITIATIVE APPLICATION FOR GRANT ROUND 13 COMPETITION:STAGE 2

Please read the Guidance Notes before completing this form. Applications will be considered on the basis of information submitted on this form and you should give a full answer to each question. Please do not cross-refer to information in separate documents except where invited on this form. The space provided indicates the level of detail required. Please do not reduce the font size below 11pt or alter the paragraph spacing. Keep within word limits.

1. Name and address of organisation

Name:	Address:
University of Sussex	Falmer, Brighton, East Sussex, BN1 9QG, UK

2. Project title (not exceeding 10 words)

Training the next generation of Papua New Guinean conservation biologists

3. Project dates, duration and total Darwin Initiative Grant requested

Proposed start date: 1st September 2005			Duration of project: 3 years		
Darwin funding requested	**Total**	**2005/06**	**2006/07**	**2007/08**	**2008/09**
	£197,555	**£51,285**	**£70,058**	**£50,894**	**£25,317**

4. Define the purpose of the project in line with the logical framework

One of the major obstacles to successful conservation planning in Papua New Guinea (PNG) is the extremely deficient state of knowledge relevant to biodiversity conservation. Furthermore, the country lacks trained biologists who can obtain the requisite data. Thus, the purpose of this project is twofold: (1) train new conservation biologists who can become the conservation leaders of tomorrow, and (2) in the process of that training, gather highly relevant data that can be used to guide conservation planning and policy. Specifically, our training will reconnect largely overseas-driven biological research with mostly locally administered university teaching. The Wildlife Conservation Society (WCS) and the New Guinea Binatang Research Center (BRC) will uniquely combine resident and visiting researchers, resident local students and parataxonomist staff to create an intellectually stimulating environment conducive to high quality postgraduate training and research. This research will examine the impacts of different levels of land and forest use on biodiversity, focusing on invertebrates (both terrestrial and aquatic) but extending to include forest vertebrates. Despite the many concerns over forest conversion and resource use, there are few data measuring the actual impacts of these activities on PNG's unique and endemic biota. We expect the project to remedy the serious lack of opportunities for postgraduate training in biology in PNG, particularly in the study of the country's hyper-diverse fauna, and to create conditions for continued in-country training, by establishing a training infrastructure and, through training, two local (PNG national) project co-ordinators who will supervise student learning and research. The expertise available to students will be broadened by UK researchers (including from the Natural History Museum (NHM) and the University of Sussex (UoS)) visiting PNG to run intensive training courses in taxonomy and ecology and to oversee the supervision of conservation-related research projects. A UK co-ordinator will be employed for the first year of the project to assemble appropriate teaching materials, supervise the PNG co-ordinators' 2-month intensive training in the UK and then to initiate, oversee and partake in the training of the student conservation biologists in PNG.

5. Principals in project. Please provide a one page CV for each of these named individuals

Details	**Project Leader**	**Other UK personnel (working more than 50% of their time on project)**	**Main project partner or co-ordinator in host country**
Surname	Stewart		Mack
Forename (s)	Alan J. A.		Andrew
Post held	Senior Lecturer in Invertebrate Ecology		Programme Director
Institution	University of Sussex		Wildlife Conservation Society
Department	School of Life Sciences		---

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

University of Sussex (UoS): *Developing local capacity for biodiversity surveys in Papua New Guinea* (162/10/030) lead by A.J.A. Stewart, 2001-2004, with BRC as the PNG partner. The Natural History Museum (NHM) has lead 21 DI projects in 15 countries in the past 11 years.

7. IF YOU ANSWERED NO TO QUESTION 6 describe briefly the aims, activities and achievements of your organisation. (Large institutions please note that this should describe your unit or department)

Aims (50 words)
Activities (50 words)
Achievements (50 words)

8. Please list the overseas partners that will be involved in their project and explain their roles and responsibilities in the project. Describe the extent of their involvement at all stages, including project development. What steps have been taken to ensure the benefits of the project will continue despite any staff changes in these organisations? Please provide written evidence of partnerships.

List of overseas partners:

• The **Wildlife Conservation Society** Papua New Guinea Program (WCS) and the New Guinea **Binatang Research Center** (BRC) (Binatang means insect in the dominant PNG language, Tok Pisin) are dedicated to building scientific capacity in PNG, particularly for better conservation of the country's biodiversity. Both organisations do this through sponsoring and training PNG students and parataxonomists, conducting research, and maintaining the infrastructure needed to promote biodiversity conservation (research stations, systematic collections, etc.). They contributed equally to the proposal development and will jointly manage in-country logistics of the project, provide infrastructure, house PNG DI co-ordinators and the trainee students, and teach the Conservation Biology Course. WCS and BRC senior scientific staff (2 PhD, 5 MSc) will act as mentors and supervise students supported by this grant. Two senior national staff, K. Sagata and D. Bito, will act as the local coordinators of the project at WCS and BRC respectively. WCS will host and train PNG honours students in its biodiversity training centre in Goroka, and BRC will do the same at its research base in Madang. Other WCS and BRC assets, such as vehicles, field equipment, laboratory space, libraries, etc. will be available to the research fellows supported by this grant. WCS and BRC will work jointly with the following in the specified activities:

• **University of PNG** (UPNG) and **University of Technology PNG** (Unitech): help select course participants; incorporate postgraduate DI training in their teaching curricula; award BSc Honours degrees to DI trainees;

• **Research and Conservation Foundation** (RCF): facilitate participants' outreach to local communities;

• **Department of Environment and Conservation** (DEC): recipient of biodiversity information used to formulate PNG government conservation strategies

• **PNG National Agricultural Research Institute** (NARI): the center of entomological expertise in PNG, housing the National Insect Collection; in-country deposit of DI-produced insect specimens.

Ensuring continuity:

WCS has worked in PNG since the 1970s, BRC since 1995. Both organisations have a stable team of senior national and international scientific staff and an excellent record of sustained student training and research productivity in PNG. Both organisations have long and well established working relationships with both of the major national universities (UPNG, Unitech), governmental agencies (DEC) and local institutions involved in biodiversity conservation and biological research (NARI, RCF).

9. What other consultation or co-operation will take place or has taken place already with other stakeholders such as local communities? Please include details of any contact with the government not already provided.

WCS and BRC have long-standing agreements with local communities where research will occur as well as formal approval for research from Provincial Governments. WCS is on the Board of Trustees of the Gahavasuka Provincial Park, and BRC is in close collaboration with the Boards of the Kau Wildlife Area and Ohu Conservation Area, i.e. some of the sites where research will occur.

PROJECT DETAILS

10. Is this a new initiative or a development of existing work (funded through any source?) Are you aware of any other individuals/organisations carrying out similar work, or of any completed or existing Darwin Initiative projects relevant to your work? If so, please give details explaining similarities and differences and showing how results of your work will be additional to any similar work and what attempts have/will be made to co-operate with and learn lessons from such work for mutual benefits.

This is a new initiative building on the foundations laid by the WCS and BRC. Both organizations have been actively conducting research and training students for a decade. The trainers at these organizations are among the most field-experienced biologists living or working in Papua New Guinea due to the long-term commitment to building scientific excellence in PNG. Through collaboration with Dr Alfried Vogler's team, the project will also build on NHM's considerable experience in running DI projects and its unrivalled expertise in taxonomy.

Similar work within PNG: There is no programme of postgraduate training of biologists focused on environmental and conservation issues in the country that is comparable to ours. The proposed project is also a logical extension of the recently-completed DI project 162/10/030 "*Developing local capacity for biodiversity surveys in PNG*" (lead by Dr. A.J.A. Stewart, Sussex University) that trained parataxonomists to become capable of basic biodiversity fieldwork and researching forest insect ecology and diversity. The present project targets trainees at the next highest level of expertise: those that already set or influence policy in PNG or will do so in the future.

11. How will the project assist the host country in its implementation of the Convention on Biological Diversity? Please make reference to the relevant article(s) of the CBD thematic programmes and/or cross-cutting themes (see Annex C for list and worked example) and rank the relevance of the project to these by indicating percentages. Is any liaison proposed with the CBD national focal point in the host country? Further information about the CBD can be found on the Darwin website or CBD website.

The project will foster international cooperation between PNG and UK scientists to provide the extensive training and mentoring needed by conservation professionals and university students in PNG. The project will contribute to PNG's implementation of the following CBD Articles: 5 - Cooperation (10%), 6 - NBSAP (5%), 7 - Identification and Monitoring (5%), 12 - Research and Training (25%), 13 - Education and Awareness (5%), 14 - Impact Assessment (25%), 17 - Exchange of information (15%), and 18 - Technical and Scientific Cooperation (10%). The project addresses the following cross-cutting issues: Public Education and Awareness, Sustainable use of Biodiversity and Protected Areas, and will contribute to the implementation of work programmes on Forest Biodiversity, Mountain Biodiversity, and Agricultural Biodiversity. The project fully addresses GTI operational objectives 1, 2, 3, and 4.

12. How does the work meet a clearly identifiable biodiversity need or priority defined by the host country? Please indicate how this work will fit in with National Biodiversity Strategies or Environmental Action Plans, if applicable.

PNG does not yet have a NBS or BAP, partially because it lacks the national capacity to draft one and partly because the existing data are too deficient. The project meets with needs spelled out in the document *Conservation Needs Assessment* (1993), particularly for better-trained national biologists and direct measures of impacts of different resource use practices. Further, the *Conservation Needs Assessment* identified poor knowledge of the country's biota, representing 5-8% of the world's biodiversity, as a major obstacle to designing conservation strategies.

13. If relevant, please explain how the work will contribute to sustainable livelihoods in the host country.

Over 80% of Papua New Guineans depend directly on their traditional resources, forests and reefs for their sustenance. However, traditional practices are either being lost or proving unsustainable in the face of a rapidly growing population. Moreover, new resource pressures, particularly logging and mining, are adding novel stresses to the environment. It is essential that in the face of these new and increased demands, science informs decisions on the management of resources that support the livelihoods of millions of rural people. However, very few studies have directly examined the impacts of different resource-use practices. Therefore, it is impossible for science to help guide the way in which resources are utilised and minimize the detrimental impacts of different kinds of extraction. It is particularly important to provide information to grassroots village landowners, who control about 97% of the land area in PNG, when they weigh their options for future development. If the environment becomes too severely impacted by forestry or mining, the cash economy will not be sufficient to support the millions of people whose livelihoods are currently based upon traditional subsistence. The students trained by this project will be able to address these issues within their local communities and at the regional and national levels.

14. What will be the impact of the work, and how will this be achieved? Please include details of how the results of the project will be disseminated and put into effect to achieve this impact.

Impacts: (i) A cohort of trained PNG biologists will spearhead PNG's growing interest and concern in preserving sustainable rural livelihoods. Conservation leadership in PNG, as in any country, must come from within the country; British and other expatriate scientists cannot act as leaders. Thus it is essential that those PNG nationals who are leading the national conservation agenda have the fullest and best training possible. This project will help build a cohort of effective future conservation leaders. (ii) By generating empirical data that directly measure the impacts of different levels of forest clearance on biodiversity, it will be possible, for the first time in PNG, to develop specific management recommendations to minimize impacts on biodiversity. (iii) New reference collections will be set up and existing ones enhanced, helping to generate greater knowledge and appreciation of the country's considerable biotic diversity.
Dissemination of results will initially be through conferences and lectures, such as the annual New Guinea Biological Conference, and then through national and international publications and policy papers. Ultimately, results will be further disseminated as the trainees from the program integrate into the existing conservation and management community in PNG (NGOs, universities and government).

15. How will the work leave a lasting legacy in the host country or region?

The knowledge, skills and experience obtained by the Papua New Guineans trained by this project will be its most important legacy. This cohort of well-trained conservation experts in PNG will be able to identify priorities and culturally appropriate solutions to problems better than their predecessors. The best of them will become trainers of the next generation of PNG biologists. The long-term conservation of PNG's extraordinary biodiversity will largely depend upon PNG conservationists who can employ cutting-edge methodologies, implement the CBD and disseminate biodiversity information to their communities and to future scientists and policy makers. Furthermore, the project will make a lasting contribution to the knowledge of PNG biodiversity, including biological specimens and conservation-relevant biodiversity information. Finally, the project will strengthen WCS and BRC as the foci of national postgraduate training in conservation-oriented biological sciences.

16. Please give details of a clear exit strategy and state what steps have been taken to identify and address potential problems in achieving impact and legacy.

Exit strategy:
• Many potential trainees already hold conservation-related employment and will have immediate and long-

term impact by training others (university educators) and by developing policy (government, NGOs).
• The knowledge and information network established will enhance collaboration among PNG institutions and between PNG and international scientists via direct UoS and NHM contacts. The dissemination of information by course participants to their local communities will raise awareness and knowledge of species diversity and conservation, and will enhance local decision-making processes.
• Extensive training in field and laboratory based biodiversity techniques, conservation biology and taxonomy and further training in research methods, scientific report writing and presentation skills will enable students to compete highly effectively for available employment. Participants will be better able to secure funding for research and education from other PNG and international sources.
• In-country infrastructure established by this project (e.g. insect reference collections, enhanced lab facilities) will enable NARI, UPNG, WCS and BRC to study the country's biota more efficiently for better conservation planning and teaching in the future.
• WCS and BRC are committed to training and will continue mentoring students after the end of the grant period, actively fund-raising for biodiversity research training and the long-term employment of the Darwin PNG co-ordinators.
Achieving impact/legacy: WCS and BRC have each maintained a permanent office and a range of field research sites in PNG for 5 and 10 years respectively. Through their previous experience in wildlife biology training and interaction with a wide range of stakeholders, these partners have witnessed most of the potential problems that could impact this project and have developed strategies at all appropriate levels, from government to village landowners, to resolve problems that arise. All the collaborators in this project (from UoS, NHM, WCS and BRC) have extensive expertise in taxonomic training, field collection and conservation work, have demonstrated commitment to the project and have the necessary support from all appropriate institutions and agencies.

17. How will the project be advertised as a Darwin project and in what ways would the Darwin name and logo be used?

The Darwin Initiative logo and an acknowledgement of DI support will be used in all publications, theses, posters, teaching materials etc. WCS will put a regular feature about the DI project in the WCS-PNG Newsletter (c. 400 recipients) and Tropical Forest Digest (c. 800 recipients world-wide). Both the WCS and BRC web sites will feature the project. Regular press releases will highlight the progress of the DI program. The DI support for research will be acknowledged at all public presentations and seminars in PNG and internationally.

18. Will the project include training and development? Please indicate who the trainees will be and criteria for selection and that the level and content of training will be. How many will be involved, and from which countries? How will you measure the effectiveness of the training and will those trained then be able to train others? Where appropriate give the length and dates (if known) of any training course. How will trainee outcomes be monitored after the end of the training?

Eight university graduates will be selected for 18-months BSc Honours training each. Selection will be competitive, based on CV and demonstrated ability in taught courses. Criteria for student selection will also include a month long field screening process that WCS subsidizes. Top students are invited to a field course and their performance carefully scrutinized by the project leaders. Only the best and most committed students can pass this rigorous evaluation process. Two PNG training and research co-ordinators will also be trained. All trainees will be intensively (daily) mentored by WCS, BRC, UoS and NHM staff and formally evaluated at UPNG. A full teaching schedule will be developed early in the project by the UK co-ordinator that will define, *inter alia*: the objectives; teaching and learning methods; conceptual, specific or transferable skills to be acquired; learning outcomes; methods of assessment; and research project topics. The PNG local co-ordinators will visit the UK together for 2 months to obtain training in collection management and the latest taxonomic methods. Upon completion, the trainees will give project presentations at a national congress (the annual New Guinea Biological Congress) and in training workshops. They will achieve advanced teaching skills and assist WCS, BRC, UPNG, Unitech etc. to train others in the future. Ultimately, outcomes will be judged by how many students obtain placements in appropriate professions in PNG.

LOGICAL FRAMEWORK

19. Please enter the details of your project onto the matrix using the note at Annex B of the Guidance Note. This should not have substantially changed from the Logical Framework submitted with your Stage 1 application. Please highlight any changes.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: **To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve** • **the conservation of biological diversity,** • **the sustainable use of its components, and** • **the fair and equitable sharing of benefits arising out of the utilisation of genetic resources**			
Purpose To enhance the in-country capacity of PNG to implement the CBD by postgraduate training of outstanding PNG students to became local leaders in biodiversity conservation and research.	a) PNG students better trained in conducting biodiversity research & monitoring b) Enhanced capacity to conduct and communicate biodiversity research & implement conservation policy by PNG nationals. c) Better characterisation of aquatic and terrestrial biodiversity associated with different land use patterns in PNG forests.	a) Honours degrees awarded b) Student course reports, theses and presentations at NG Biological Conferences c) Research publications on biodiversity patterns by students and researchers	a) There are enough talented and interested students for the postgraduate training programme b) Government & local landowners will consult with and trust scientists & policy makers. b-c) Majority of participants in training courses will take up careers relevant to CBD implementation in PNG
Outputs a) 2 training courses for PNG students b) 8 BSc. Honours students trained (18 months each) c) 2 PNG local coordinators trained, including in UK d) Insect reference collection enhanced with specimens and databases e) Baseline biodiversity surveys in lowland and montane disturbed and undisturbed forests conducted	a) 30 participants trained in biology and biodiversity sciences b) 8 students trained c) 2 PNG local coordinators receive UK-based training in taxonomic & DNA methods to implement future training courses in PNG d) Collections enhanced at WCS, BRC, UPNG, NARI, databases online. e) Samples collected, sorted and analysed, museum specimens prepared, data analysed	a) Attendance lists, exam results b) 8 BSc degrees awarded; theses and reports, 8 conference presentations c) 2 seminars at NHM, 2 research publications; d) Specimens receipt acknowledged by the institutions, database evaluation by users e) 4 research publications, report to DEC	a) Active participation of students b) Students are dedicated and capable of carrying out and completing ambitious research work independently c) the PNG local coordinators is interested in broadening his experience overseas. d) sufficient time and facilities for collecting, design of ID tools, collections facilities supported by PNG institutions e) research is cutting-edge

Activities	Activity Milestones (Summary of Project Implementation Timetable)
Training: Honours programmes.	Yrs 1-2: Cohort 1, Yrs. 2-3: Cohort 2 of students enrols, completes research, writes and defends theses
Training: Research and training coordinators	Yrs. 1-3: Training, project co-ordination and student supervision duties in PNG; Yr. 1: Two PNG local co-ordinators trained in UK
Information products & reference collections.	Yrs. 1-2: Fieldwork, databasing; Yrs 2-3: Identification tools created, reference collections and databases enhanced
Field research programme & work with landowners.	Yrs 1-3: Research conducted, Yrs. 2-3 research results summarized in technical papers but also in accessible materials to be distributed to schools & village communities; conservation recommendations to Government.

20. Provide a project implementation timetable that shows the key milestones in project activities.

Project implementation timetable		
Date	**Financial year**	**Key milestones**
	Apr-Mar 2005/6	4 BSc Honours students recruited, trained and complete field work for their research; Short Conservation Biology course completed
	Apr-Mar 2006/7	4 BSc Honours students complete their studies, 4 new students enrolled and start research; 2 PNG coordinators trained in UK
	Apr-Mar 2007/8	Short Conservation Biology course completed, Students present results and NG Biological conference
	Apr-Mar 2008/9	4 BSc Honours students complete their studies, 2 PNG research and training coordinators complete their training
Sep 05	Apr-Mar 2005/6	Project setup, capital items purchase
Sep 05	Apr-Mar 2005/6	4 Honours students enrolled (cohort 1)
Oct-Nov 05	Apr-Mar 2005/6	2 PNG coordinators trained in UK
Nov 05	Apr-Mar 2005/6	Short course in Conservation Biology
Oct 05-Sep 06	Apr-Mar 2005/6 - 06/07	Student field research under supervision
Jul 06	Apr-Mar 2006/7	Students present results at NG Biological Conference
Oct 06-Feb07	Apr-Mar 2006/7	Students analyse data and write dissertations
Mar 07	Apr-Mar 2006/7	Students complete dissertations and graduate
Mar 07	Apr-Mar 2006/7	Students prepare results for publication
Apr 07	Apr-Mar 2006/7	4 Honours students enrolled (cohort 2)
Apr 07-Mar 08	Apr-Mar 2007/8	Student field research under supervision
Jul 07	Apr-Mar 2007/8	Students present results at NG Biological Conference
Apr-Jul 08	Apr-Mar 2008/9	Data analysis and thesis writing
Aug 08	Apr-Mar 2008/9	Students complete dissertations and graduate
Aug 08	Apr-Mar 2008/9	Students prepare results for publication
Aug 08	Apr-Mar 2008/9	2 research and training coordinators complete their training.

21. Set out the project's measurable outputs using the separate list of output measures.

PROJECT OUTPUTS		
Year/Month	**Standard output number (see standard output list)**	**Description (include numbers of people involved, publications produced, days/weeks etc.)**
2005/2006		
November	6A, 6B	10 participants x 3 weeksConservation Biology course
November	7	2 Conservation Biology course materials
November	15A	2 national DI project press releases (with UK High Commission)
November	19A, 19C	2 national DI project announcements
December	20	4 computers, 2 printers, 1 digtal camera and insect storage facility, £7,700
January	13A	Insect reference collection established at WCS
January	22	2 permanent plots (Crater Mt. and Ohu Wildlife Area) established
September-March	8	3 UK personnel 18 weeks in PNG for student training
2006/2007		
May	7	Postgraduate training manual on biodiversity survey methods
May	7	2 Conservation Biology course materials
July	14B	4 student presentations at NG Biological Conference
August	10	Forest Biodiversity field guide produced
March	4C, 4D	4 BSc Honours PNG students graduate after 18 months of training
March	15A, 15B	2 press release, student graduation announced
March	11A, 11B	4 papers from Hons. dissertations
April-March	8	3 UK personnel 22 weeks in PNG for student training
2007/2008		
May	7	Postgraduate training manual on insect biodiversity and identification
May	6A, 6B	10 participants x 3 weeksConservation Biology course
July	14B	4 student presentations at NG Biological Conference
August	12A, 12B	1 insect biodiversity database established at WCS and 1 enhanced at BRC
August	10	Freshwater Biodiversity field guide produced
April-March	8	2 UK personnel 5 weeks in PNG for student training
2008/2009		
March	15A, 15B	2 press release, student graduation announced
August	4C, 4D	4 BSc Honours PNG students graduate after 18 months of training
August	5	2 PNG Training & Research Co-ordinators complete 3-years training
August	11A, 11B	4 papers from Hons. dissertations
August	13B	2 insect reference collections enhanced at BRC and NARI
August	9	1 Habitat management plan (Crater Mt.)
August	23	£277,777 raised at UoS, NHM, WCS & BRC
April-August	8	2 UK personnel 5 weeks in PNG for student training

MONITORING AND EVALUATION

22. Describe, referring to the Indicators in the Logical Framework, how the progress of the project will be monitored and evaluated, including towards delivery of its outputs and in terms of achieving its overall purpose. This should be during the lifetime of the project and at its conclusion. Please include information on how host country partners will be included in the monitoring and evaluation.

The progress of each student will be carefully monitored by the mentors to ensure that the research and training remains on schedule; this will include the set-up and implementation of the field work, sample processing, data analysis, and thesis and manuscript writing. The evaluation will be facilitated by a mid-term seminar required from each student. The UPNG and Unitech internal student evaluation procedures will also help to assess the students' progress. The training of the PNG local co-ordinators as well as the overall progress of the project will be monitored by a Steering Committee (SC) comprising the senior collaborators from UoS, NHM, WCS and BRC. The SC will review progress on a semi-annual basis through reciprocal reporting, keeping in regular email contact throughout the project. All the senior collaborators have managed large training and research projects of comparable complexity in the past. The career development of each DI student will be followed beyond the lifetime of the project. All project partners, in both UK and PNG, will be equally involved in monitoring, steering and evaluation of the project.