

Darwin Initiative – Final Report

(To be completed with reference to the Reporting Guidance Notes for Project Leaders
(<http://darwin.defra.gov.uk/resources/reporting/>) -

it is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

Darwin project information

Project Reference	EIDPO014 (UEA project code: R14193)
Project Title	Devising strategies to integrate biodiversity conservation in plantation dominated landscapes.
Host country(ies)	Brazil
UK Contract Holder Institution	University of East Anglia
UK Partner Institution(s)	
Host Country Partner Institution(s)	Museu Paraense Emílio Goeldi (MPEG), Universidade Federal de Lavras (UFLA)
Darwin Grant Value	£50,004
Start/End dates of Project	01 May 2006 / 31 July 08
Project Leader Name	Prof Carlos Peres
Project Website	http://www.tropicalforestresearch.org/
Report Author(s) and date	Carlos Peres, Jos Barlow and Toby Gardner, 10 December 2008

1 Project Background

This project followed on from DI project 0014. The main purpose of this post-project was to identify and examine the trade-offs between the management of tropical forest land use mosaics for both production and conservation of biological diversity. We sampled ecological indicator taxa across multiple forest sites, attempting to address the effects of tree plantation productivity, the influence of the surrounding landscape matrix, and the value of existing primary forest corridors that lie between silvicultural stands. The project used skills and institutional links that were well developed during the original project, and built on our previous purpose which was to identify the most efficient indicator taxa and quantify the value of tree monocultures, native secondary forests, and primary forest *independently* of external influences.

2 Project support to the Convention on Biological Diversity (CBD)

In attempting to maximise biodiversity conservation opportunities in the management of large-scale tropical forest landscapes, we addressed the main objective (Article 1) of the CBD to conserve biodiversity while allowing sustainable use of its components in the context of a 'working' forest landscape (specifically Article 10, subparagraphs [a] and [b]). Our attempts to improve training in biodiversity sampling and research through host-country capacity building directly address Article 12 of the convention (subparagraphs [a] and [b]) which calls for contracting parties to take account of the particular needs of developing countries. By integrating the joint goals of biodiversity conservation and tropical forest production we responded to the expanded programme of work on forest biological diversity (annex to [decision VI/22](#)), adopted in 2002 by the Conference of the Parties at its sixth meeting, as well as three of the key focal areas of the 2010 CBD Biodiversity Target (subparagraphs a,b & d, paragraph 1 of decision VII/30). Specifically, the project will meet key objectives of the Forest Biodiversity Thematic Programme of the CBD in shedding light on cross-cutting issues such as (1) interactions between climate change and forest biodiversity – through developing our understanding of afforestation and revegetation schemes under the Clean Development Mechanism of the Kyoto Protocol ; (2) developing key bioindicator protocols to assess forest

ecosystem integrity; (3) institutional capacity building; and (4) strengthening local taxonomic and curatorial expertise for zoological collections and herbaria across Amazonia.

3 Project Partnerships

The project helped develop lasting partnerships between the University of East Anglia and the: Museu Paraense Emílio Goeldi (MPEG), who supplied local Masters students, curated specimens, and helped with the identification of voucher specimens.

Federal University of Lavras, who supplied Masters students, and helped curate and identify dung beetle specimens, and develop the beetle guide book.

Jari Celulose SA: Owner of plantation forests.

ORSA Florestal: Owner of the wider landscape and primary forest landholdings.

In addition, all host country project partners (Lavras, MPEG, Orsa and Jari) have subsequently developed links between each other independently of UEA.

4 Project Achievements

4.1 Impact: achievement of positive impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits

The project is expected to have positive outcomes for biodiversity conservation in the Jari region. Based on the data collected during this project and the original Darwin project we have been directly involved in decision making regarding the allocation of forest reserves, and it seems very promising that the final outputs regarding landscape-scale trade-offs will be integrated into the management strategy of these forestry companies. The project has wider reaching outcomes through academic publications, workshops and dissemination, although these are harder to quantify in terms of net positive impacts. In the longer-term we are also seeking to deliver our results directly to a wider network of forest management enterprises and the Forest Stewardship Council in an effort to feedback into revised management standards and criteria.

4.2 Outcomes: achievement of the project purpose and outcomes

Output 1) Eucalyptus plantation landscape analysis using pre-identified focal indicator taxa: 48 sites were sampled across the landscape, collecting data on the abundance and composition of dung-beetles and fruit-feeding butterflies as well as vegetation structure. Data being analysed.

Output 2) Evaluate functional role of native forest corridors and their value to biodiversity conservation: 24 corridor sites were sampled across the landscape, collecting data on the abundance and composition of 5 taxa (dung-beetles, birds, large vertebrates, scavenger flies and fruit-feeding butterflies) as well as vegetation structure. Data being analysed, and one publication on the birds has already been produced.

Output 3) Improve regional and national capacity to undertake effective biodiversity surveys: Training of MSc students undertaken, including ongoing work to support and guide the students in the publication of their results. National-level workshop on biodiversity in human-modified landscapes was organised in Belém in November 2007 (see annex).

Purpose: Identify and analyse existing trade-offs between the management of tropical forest landscapes for economic production and the conservation of biological diversity: Biodiversity data collected, economic data have recently been made available and are being analysed.

4.3 Outputs (and activities)

All main activity milestones were undertaken on time. However, we are still analysing data to produce the final management guidelines (although we have handed over, in the form of a report written in Portuguese, preliminary guidelines to Jari and the FSC auditors on the value of forest corridors).

4.4 Project standard measures and publications

Training outputs were undertaken as planned.

Invertebrate specimen collections (including photographic material) were donated to Federal University of Lavras and MPEG, and a bilingual key and guide to dung-beetles of the Jari region is being prepared for publication (to be published by the Instituto Nacional de Pesquisas de Amazonia).

UK investigators spent over 60 weeks in the host country (J.Barlow 50, C.Peres 10).

2 papers have been submitted to high quality peer-reviewed journals, three more are in preparation.

All data has been compiled into a database, and handed over to Jari, MPEG and University of Lavras collaborators.

A high-profile 3 day multi-stakeholder (science, forestry industry, government) workshop was organised in Belém, Pará, Brazil, hosted by MPEG and organised by the authors of this report. Attendees included representatives from many Brazilian institutions (see Annex).

Five key international conservation and tropical biology conferences (e.g. SCB, ATBC) were attended by lead investigators (SCB, South Africa 2006, ATBC, Surinam 2008, BES London 2008, the Darwin Initiative workshop on climate change at ZSL, and a high-profile Amazon Biodiversity conference recently held in Manaus, Brazil)

Press releases in the host country (Brazil), and UK are planned to coincide with publication of highest impact papers (still to come)

Over 12 international and national interviews aired on radio in UK and Brazil – mostly resulting from the MPEG workshop.

4.5 Technical and Scientific achievements and co-operation

This project was based on a high level of cooperation between host country partners, including MPEG and Jari/Orsa. It also helped to integrate institutions from the north of Brazil (MPEG) with those in the rest of Brazil, in particular the Federal University of Lavras.

4.6 Capacity building

Comprehensive training was provided for two MSc and two undergraduate students from MPEG and Federal University of Lavras. In addition, we continued to advance our current training program of technicians from MPEG and field technicians within the Jari region. The workshop made a tangible advance in developing the capacity of the commercial forestry sector and Brazilian state government representatives to interact with Brazilian scientists. Improved communication between science groups working in different parts of Brazil was also noted as a major positive output by many of the workshop participants in their feedback.

4.7 Sustainability and Legacy

All project partners have remained in close contact with each other. Academic research and monitoring within Jari is now being led by Gustavo Scheffler, a post-doctoral employee of the Federal University of Lavras. The grant application for this post-doctoral position (to the Brazilian Government) was written during the lifetime of this project to ensure its legacy. Supported by the strong foundations laid during our two Darwin projects we now have in place a long-term and very secure monitoring and evaluation programme of the Jari landscape that will include annual training of MSc and PhD students from Brazil and field technicians (both local and from elsewhere). Thanks to our work during the Darwin funded phases of this work we were able to demonstrate the quality and value of our work to the forestry company (Grupo Orsa) directorate and convince them to commit sufficient core funds to ensure the monitoring work continues on an annual basis. The development of a novel selection mechanism for identifying cost-effective indicator taxa for biodiversity research in tropical forests has

generated a legacy that reaches beyond Brazil and has received broad interest from scientists working in human-modified forest landscapes across the tropics.

5 Lessons learned, dissemination and communication

5.1 Darwin identity

The wide range of scientists (including ecologists and taxonomists at multiple levels) involved in our project and the high-profile representation of scientists, industry and government officials from across Brazil that participated in our workshop (Annex 6) has ensured that the Darwin name (and logo) has become familiar across a wide range of institutions. All publications (published and pending) have given full acknowledgement to Darwin support and the Darwin logo was headlined during the workshop on conference brochure material, posters and during the opening and closing ceremonies. The Darwin logo has and will continue to appear on all conference talks and other lectures resulting from this study, as well as on the project website (which continues to receive hundreds of hits per month – see our web site www.tropicalforestresearch.org)

6 Monitoring and evaluation

6.1 Actions taken in response to annual report reviews

The annual report (EIDPO014) did not identify specific requirements or recommendations for change other than to say that the post project appeared to be making excellent progress.

7 Finance and administration

7.1 Project expenditure

7.2 Additional funds or in-kind contributions secured

CNPq fellowship for Dr Jos Barlow (12 months salary) £XXXX

ORSA Florestal and Jari Celulose: Accommodation in project house for duration of field work = £4,000

Darwin Initiative (main project) and UEA: One 4WD Toyota Bandeirante = £5,000

Darwin Initiative (main project) and UEA: One Fiat Palio = £2,000

Jari Celulose matched funding for field costs - £16,000

Matched funding for Workshop (21-23rd November 2008)–

WWF Brasil = £3,500

TNC Brasil = £2,500

British Council = £5,000

Conservation International do Brasil = £3,500

UK Royal Society = £1,400

SEDEC/FADESPA = £1,250

MPEG / FIDESIA = £1,500

Petrobras SA. = £3,000

CAPEX = £3,500

Total matching funds = £69,150

7.3 Value of DI funding

£50,004

Annex 1 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
<p>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</p> <ul style="list-style-type: none"> • The conservation of biological diversity, • The sustainable use of its components, and • The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 		<p>Through a continuous process of project development, data collection and dissemination of findings we have contributed novel information and understanding to both the local forest management authority and the broader forest certification community on methods to improve the sustainable use of managed forest systems</p>	<p>Continued dissemination of findings</p>
<p>Purpose: Identify and analyse existing trade-offs between the management of tropical forest landscapes for economic production and the conservation of biological diversity.</p>	<p>Identify management options which maximise biodiversity conservation opportunities within tropical production forests.</p> <p>Local capacity increased for forest biodiversity surveys.</p>	<p>We identified the importance of stand-scale plantation management for biodiversity conservation in <i>Eucalyptus</i> plantations, especially through the maintenance of a structurally complex and floristically diverse understory. Landscape context was shown to be less important than local stand management in determining spatial patterns of biodiversity although distance to primary forest was important.</p> <p>We identified the complementary value of narrow terra firme forest strips as well as riparian buffer strips in providing valuable habitat for vertebrates and invertebrates. Maintenance of both terra-firme and riparian buffers can make an important contribution towards mitigating the impact of plantation forestry on biodiversity.</p>	<p>Continue to work closely with the management company and wider certification authority (Forest Stewardship Council) to integrate our findings into the local management plan and broader certification management standards (through FSC Criteria and Indicators for the Brazilian national standard for plantation forestry)</p>

<p>Output 1. Eucalyptus plantation landscape analysis using pre-identified focal indicator taxa</p>	<p>Sampling design established and set out by month 5</p> <p>Field data collected by month 12 and specimens identified by month 14</p> <p>Peer reviewed papers and management report by month 19</p>	<p>All sampling, specimen preparation and identification and database compilation was completed within the planned time-frame of the project. Data analysis, interpretation and preparation of publications is partially complete (see Annex 5) but represents an ongoing process as existing data will continue to contribute towards future analyses in later stages of the on-going monitoring program.</p> <p>The current Darwin project served to provide further evidence in support of dung beetles (Coleoptera: Scarabaeinae) and birds as high performance ecological indicator taxa. Orchid bees, scavenger flies and vertebrates were shown to be less effective in so far as they return less robust sampling information per unit cost.</p>
<p>Activity 1.1 Undertake field component, analyse data, and publish results.</p>		<p>Two papers have been submitted to high-quality scientific journals and three more are currently in preparation.</p>
<p>Output 2. Evaluate functional role of native forest corridors and their value to biodiversity conservation</p>	<p>Sampling design established and set out by month 5</p> <p>Field data collected by month 12 and specimens identified by month 14</p> <p>Peer reviewed papers and management report by month 19</p>	<p>All sampling, specimen preparation and identification and database compilation was completed within the planned time-frame of the project. Data analysis, interpretation and preparation of publications is partially complete (see Annex 5) but represents an ongoing process as existing data will continue to contribute towards future analyses in later stages of the on-going monitoring program.</p>
<p>Activity 2.1. Undertake field component, analyse data, and publish results.</p>		<p>Two papers have been submitted to high-quality scientific journals and three more are currently in preparation.</p>
<p>Output 3. Improve regional and national capacity to undertake effective biodiversity surveys</p>	<p>Improved expertise in biodiversity sampling amongst local counterparts</p>	<p>We succeeded in training a very effective local field team (3 people) of para-taxonomists who are able to collect, record and pre-sort species samples independently. This team is now engaged in annual monitoring activities as part of the continuation of the biodiversity monitoring program supported by funding from the local management authority.</p> <p>We also trained two Master students, three research technicians and a number of undergraduate students in key issues relating to the collection analysis and interpretation of biodiversity data.</p>

Annex 2 Project's final logframe, including criteria and indicators

Project summary	Measurable indicators	Means of verification	Important assumptions
<p>Goal:</p> <p>To draw on expertise relevant to biodiversity from within the United Kingdom and to work with local partners in countries rich in biodiversity but poor in resources to achieve:</p> <ul style="list-style-type: none"> • the conservation of biological diversity, • the sustainable use of its components, and • the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources 			
<p>Purpose</p> <p>Identify and analyse existing trade-offs between the management of tropical forest landscapes for economic production and the conservation of biological diversity.</p>	<p>Identify management options which maximise biodiversity conservation opportunities within tropical production forests.</p> <p>Local capacity increased for forest biodiversity surveys.</p>	<p>Produce management guidelines</p> <p>Continued establishment (with initial phase) of globally significant insect collections at MPEG</p> <p>Field competent students and technicians available and trained</p>	<p>Guidelines accepted by landscape planners at the local level.</p> <p>Guidelines have impact upon regional, national and international forestry policies.</p> <p>Local partners are interested in continued sampling in the region and resources are made available</p>
<p>Outputs</p> <p>1) Eucalyptus plantation landscape analysis using pre-identified focal indicator taxa</p> <p>2) Evaluate functional role of native forest corridors and their value to biodiversity conservation</p> <p>3) Improve regional</p>	<p>1 & 2) Sampling design established and set out by month 5</p> <p>1 & 2) Field data collected by month 12 and specimens identified by month 14</p> <p>1 & 2) Peer reviewed papers and management report by month 19</p>	<p>1 & 2) Sampling locations mapped on GIS database</p> <p>1 & 2) Database compiled and available for analysis. Insect specimens curated in MPEG</p> <p>1 & 2) Papers accepted and published; Management report</p>	<p>1 & 2) Transport available and reliable</p> <p>1 & 2) Collaborating partners cooperate as agreed</p> <p>1 & 2) Collected material can be identified</p>

<p>and national capacity to undertake effective biodiversity surveys</p>	<p>3) Improved expertise in biodiversity sampling amongst local counterparts</p>	<p>delivered 3) 3 MSc's completed by end of project.</p>	<p>3) Students are fully integrated into the project and complete their course</p>
<p>Activities</p> <p>Outputs 1 & 2</p> <p>Output 3</p>	<p>Activity Milestones (Summary of Project Implementation Timetable)</p> <p>Identify, map and establish sampling areas and define methods (month 2)</p> <p>Undertake first seasonal replicates (months 3-6)</p> <p>Identify material from first seasonal replicate (months 7-8)</p> <p>Undertake second seasonal replicates (months 9-12)</p> <p>Identify material from second seasonal replicate (months 13-14)</p> <p>Create database and analyse data (months 15-18)</p> <p>Prepare scientific papers and management guidelines (months 19 & 20)</p> <p>Field training of MSc students (months 3-14)</p> <p>Statistical and analytical training for Masters students (Months 15-20)</p>		

Annex 3 Project contribution to Articles under the CBD

Project Contribution to Articles under the Convention on Biological Diversity

Article No./Title	Project %	Article Description
6. General Measures for Conservation & Sustainable Use	35	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	10	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	20	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	0	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	10	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	0	Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	10	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	0	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	0	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.

Article No./Title	Project %	Article Description
16. Access to and Transfer of Technology	0	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	5	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	0	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.
Other Contribution	0	Smaller contributions (eg of 5%) or less should be summed and included here.
Total %	100%	Check % = total 100

Annex 4 Standard Measures

Code	Description	Totals (plus additional detail as required)
Training Measures		
1a	Number of people to submit PhD thesis	
1b	Number of PhD qualifications obtained	
2	Number of Masters qualifications obtained	2
3	Number of other qualifications obtained	
4a	Number of undergraduate students receiving training	2
4b	Number of training weeks provided to undergraduate students	35
4c	Number of postgraduate students receiving training (not 1-3 above)	
4d	Number of training weeks for postgraduate students	
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(ie not categories 1-4 above)	1
6a	Number of people receiving other forms of short-term education/training (ie not categories 1-5 above)	1
6b	Number of training weeks not leading to formal qualification	
7	Number of types of training materials produced for use by host country(s)	
Research Measures		
8	Number of weeks spent by UK project staff on project work in host country(s)	60
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.	1
11a	Number of papers published or accepted for publication in peer reviewed journals	2
11b	Number of papers published or accepted for publication elsewhere	
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1
12b	Number of computer-based databases enhanced (containing species/genetic	

Code	Description	Totals (plus additional detail as required)
	information) and handed over to host country	
13a	Number of species reference collections established and handed over to host country(s)	2
13b	Number of species reference collections enhanced and handed over to host country(s)	
Dissemination Measures		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	1
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	3
15a	Number of national press releases or publicity articles in host country(s)	0
15b	Number of local press releases or publicity articles in host country(s)	3
15c	Number of national press releases or publicity articles in UK	
15d	Number of local press releases or publicity articles in UK	
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	
17b	Number of dissemination networks enhanced or extended	
18a	Number of national TV programmes/features in host country(s)	2
18b	Number of national TV programme/features in the UK	0
18c	Number of local TV programme/features in host country	2
18d	Number of local TV programme features in the UK	
19a	Number of national radio interviews/features in host country(s)	1
19b	Number of national radio interviews/features in the UK	
19c	Number of local radio interviews/features in host country (s)	4
19d	Number of local radio interviews/features in the	

Code	Description	Totals (plus additional detail as required)
	UK	
Physical Measures		
20	Estimated value (£s) of physical assets handed over to host country(s)	£4500
21	Number of permanent educational/training/research facilities or organisation established	
22	Number of permanent field plots established	
23	Value of additional resources raised for project	
Other Measures used by the project and not currently including in DI standard measures		

Annex 5 Publications

Type *	Detail	Publishers	Available from	Cost
(eg journals, manual, CDs)	(title, author, year)	(name, city)	(eg contact address, website)	£
Journal	Hawes, J., Barlow, J. Gardner, T.A. and Peres, C.A. 2008. The value of forest strips for understorey birds in an Amazonian plantation landscape. Biological Conservation.	Elsevier	http://www.tropicalforestresearch.org/people/jbarlow.aspx	0
Journal	Barlow, J., I. S. Araujo, W. L. Overal, F. Mendes, T. A. Gardner, and C. A. Peres 2008. Diversity and composition of fruit-feeding butterflies in tropical plantation forests. Biodiversity and Conservation.. DOI: 10.1007/s10531-007-9240-0	Springer	http://www.tropicalforestresearch.org/people/jbarlow.aspx	0

Annex 6 Darwin Contacts

Ref No	
Project Title	
UK Leader Details	
Name	Dr. Carlos Peres
Role within Darwin Project	
Address	
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	Dr. Jos Barlow
Role within Darwin Project	Field coordinator
Address	Lancaster Environment Centre, Lancaster University
Phone	
Fax	
Email	
Partner 1	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax	
Email	
Partner 2 (if relevant)	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax	
Email	