Darwin Initiative – Final Report

Darwin project information

Project Reference	17-023
Project Title	Linking research and environmental education to reduce Amazonian wildfires
Host country(ies)	Brazil
Contract Holder Institution	Lancaster University
Partner Institution(s)	Museu Goeldi, Belém, Embrapa (Brazilian Agricultural Development Agency), Belém
Darwin Grant Value	£XXX
Start/End dates of Project	01/09/2009 – 28/02/2013 (extended from 31/08/2012)
Project Leader Name	Dr Jos Barlow
Project Website	http://www.redeamazoniasustentavel.org/
Report Author(s) and date	Dr Jos Barlow, Dr Toby Gardner, Dr Luke Parry, Dr Ima Vieira, Dr Joice Ferreira. 14/08/13

1 Project Rationale

Wildfires have increased dramatically in extent and frequency in the Amazon basin over the last decade, due to the spread of anthropogenic activities that frequently involve fire, unsustainably managed selective logging which dries the understory and increases fuel loads, and severe droughts linked to climate change that increase forest flammability. In this project we assessed the social and environmental costs of wildfires, focusing on subsistence farmers and cattle ranchers as key stakeholders. Our assessment took place in three regions of the eastern Brazilian Amazon (Fig. 1), each of which has experienced significant levels of deforestation and increased frequency of forest fires. The three regions – Santarém (both east and west of the River Tapajops), Paragominas and Jari - have unique histories of colonisation and agricultural development, which allowed us to address our project objectives for a range of contexts and diverse stakeholder and actor groups.

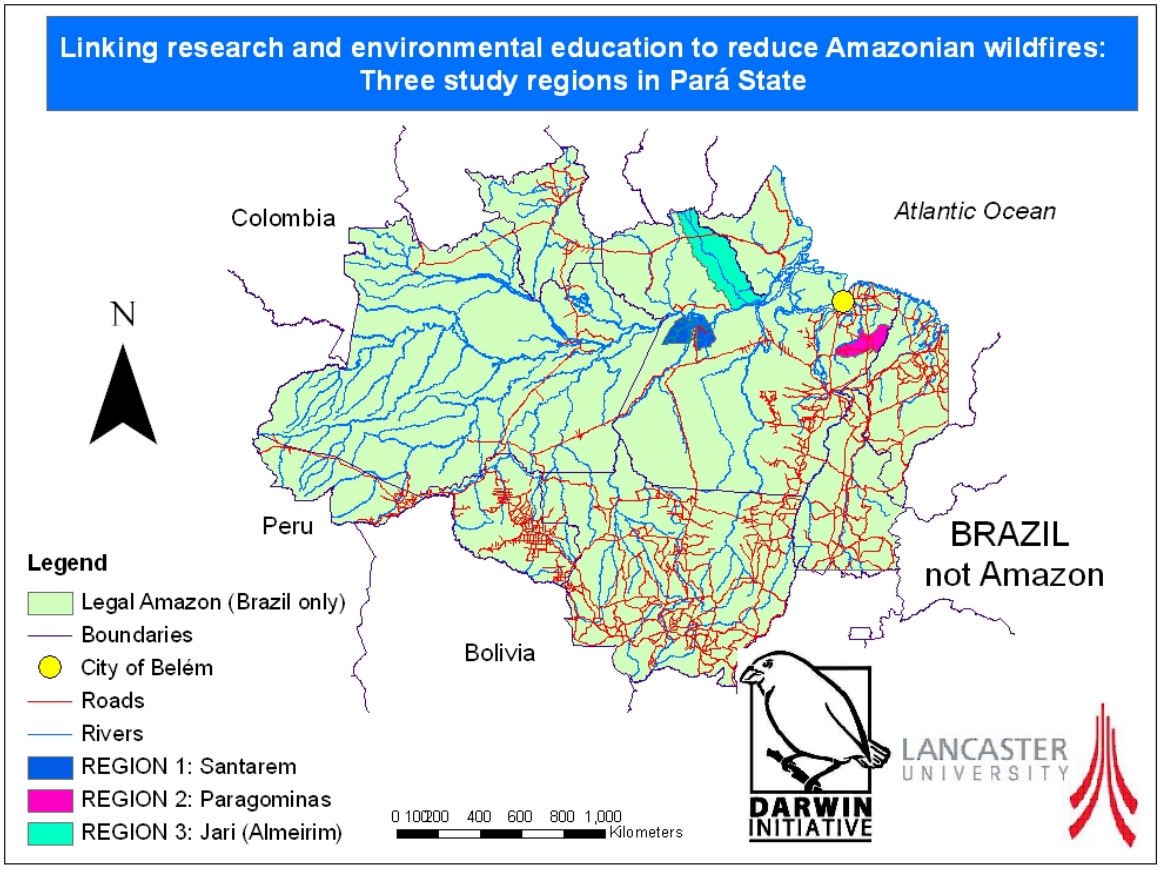

Figure 1. *Location of study regions in the Brazilian Amazon. See Gardner et al. (2013) for more detailed maps of the Santarem (east of River Tapajos) and Paragominas study regions, and Carmenta et al. (2013) for more information on the work that took place on the western side of the River Tapajos, in the Tapajos-Arapiuns Extractive Reserve and the PAE (sustainable development reserve) Lago Grande.*

2 Project Achievements

2.1 Purpose/Outcome

The original purpose was "to reduce the prevalence of Amazonian wildfires by linking earth observation, biodiversity data, and social and ethnographic research with environmental education, training, and capacity building". It quickly became apparent that while we could highlight many of the issues regarding wildfires, our impact would inevitably be diffuse, making it very difficult to monitor the exact effect of our project through assessments of satellite imagery or changes in farmer behaviour. Indeed, this high level aspiration was probably a naïve means of assessing project performance, as our research and public engagement showed that farmer behaviour (and therefore fire-use) is strongly influenced by a host of complex, inter-related factors (e.g. weather, local and State political mandates, agricultural commodity prices) that would swamp any influence of this project within the time frame of assessment.

In the early stages of the project our partnership with IDEFLOR was weakened when the director and key project partner, Raimunda Monteiro, left and became vice chancellor of a university (the Federal University of Western Pará). However, at the same time, we developed a new partnership with Brazil's public agricultural innovation agency, EMBRAPA (especially Dr. Joice Ferreira) in Belem, Brazil and aligned the Darwin project with the work of a NERC fellow (Toby Gardner) based at Cambridge University (Toby was also one of the original UK partners). This integration was motivated because the three partners were simultaneously focussing on complementary research objectives relating to different dimensions of land-use sustainability,

as well as sharing study sites and interaction with key experts and actors. It also allowed us to integrate our shared research aims with a call for Brazilian funding to develop National Institutes for Science and Technology to develop major research themes (see matched funding profile). The integration of the Darwin project with the work being coordinated by Ferreira and Gardner formed what is now called Rede Amazonia Sustentavel (RAS, or Sustainable Amazon Network in English), a research and learning network that brings together nearly 100 researchers and students (the vast majority in Brazil) from more than 30 institutions. The RAS network is very active and hosts its own website (www.redeamazoniasustentavel.org) and has helped to leverage much greater impacts from the Darwin Initiative investment.

These changes meant we were able to capitalize on major economies of scale and significantly expand the socio-economic survey of smallholder and cattle rancher management practices, covering a much greater range of biophysical and social contexts across Paragominas and Santarem, while maintaining our original work aims in Jari and on the western side of the Tapajos (the latter two work units were led by students Amanda Estefania and Rachel Carmenta, respectively). This integration also enabled us to link the work of the Darwin Initiative project with work measuring changes in biodiversity and the provision of ecosystem services associated with the effects of wildfire. Despite, or perhaps because of these changes, we believe we succeeded in delivering many of the core objectives outlined in Annex 1. Additional outputs relating to scenarios and modelling of landscape options will be completed in 2014.

2.2 Goal/ Impact: achievement of positive impact on biodiversity and poverty alleviation

We believe we made substantial progress towards our overriding aim “to help Amazonian countries meet their CBD objectives by reducing the spread of wildfires, thereby minimising biodiversity loss and helping maintain the resilience of tropical forests to climate and land-use change.” We have made significant progress in raising awareness of the issue of wildfires with scientific and public audiences, as well as highlighting specific policy concerns, although with hindsight it is clear that our actions and impact have so far been largely limited to the Brazilian Amazon. Some examples of impact include:

Our films (disseminated on YouTube: http://www.youtube.com/user/slashandburn2013) have proved popular, with over 3000 views in total, including over 1000 independent views of the Portuguese versions (see Log Frame activities 1.3 & 2.3). We have been approached by European television and NASA to use parts of our footage. We look forward to the further dissemination of the films when we revisit the farmers we worked with in 2014 (using the ECOFOR and Brazilian-funded INCT extension funding to build upon the Darwin Initiative project).

Throughout the project we have developed strong partnerships with the government, NGO and farming sectors. As part of the RAS network members of the Darwin Initiative project have played a significant role in advising the Pará state government *Municipio Verde* (Green County) program – an innovative attempt to integrate efforts across all relevant government departments in Pará to improve the environmental and social sustainability of land-use. Our relationship with the Municipio Verde program has been both long-term and strategic, and has helped them to identify priority areas of concern (including highlighting the importance of forest degradation through wildfires) as well as providing scientific input on specific questions that have arisen during the development of the program. A recent example of this is in providing guidance on the classification of regenerating forests in agricultural systems to support state zoning regulations. We also work very closely with the NGO sector, and two of the regions in which we have worked are considered to be pilot laboratories for understanding and supporting land-use sustainability by both the public and private sectors in the eastern Brazilian Amazon. The Darwin project will make a central contribution to this effort through outputs that will be delivered in 2014. Our relationship with the farmer community is also very strong following initial efforts in 2009 and 2010 to establish a network of partnerships with individual rural producers. We have continued to work closely with farmers associations, and in particular the *Sindicato de Produtores Rurais de Paragominas* (Paragominas Farmer's Union) who has been a staunch supporter of our research and the primary facilitator of our access to, and influence within, the state government Green County program.

Two scientific papers are directly relevant to fire policy. The work by Carmenta et al. (Human Ecology, 2013) highlights the discrepancies between the views of subsistence farmers and policies on fire management, as well as the importance of engaging with local farmers for the development of effective policy to support changes in land management practices. The work by Barlow et al. (Biological Conservation, 2012) highlights the importance of incorporating avoided fire into schemes such as REDD+ which are based on direct compensation payments to support improvements in forest conservation.

We expect that our work will continue to have a high impact with manuscripts currently under development that will be submitted in 2014. This includes a high impact paper that examines alternative trajectories that can support a shift away from a dependence on slash and burn agriculture in the Brazilian Amazon (initial results presented at an international conference in Brazil in June 2012), as well as regional land-use scenario planning assessments to quantify the benefits of avoiding fire and associated forest degradation at municipal and state levels.

The Darwin project will have a significant scientific legacy through ECOFOR, which is a consortium project that examines Biodiversity and Ecosystem Functioning in degraded and recovering Amazonian and Atlantic Forests. ECOFOR is funded by the National Environment Research Council (NERC) in the UK, and the Foundation for Research Support of the State of São Paulo (FAPESP) in Brazil. It is being coordinated by Dr. Jos Barlow at Lancaster University and Prof. Carlos Joly at the State University of Campinas. Partner institutions include Universities of Oxford, Leeds, Edinburgh and Imperial college in the UK, and the University of São Paulo, the São Paulo Institute of Botany, Agronomy Institute of Campinas, EMBRAPA, INPA and the Goeldi Museum in Brazil. The ECOFOR project will further our scientific understanding of the resilience of tropical forests to climate and land-use change, including fires. It will also build upon our capacity building efforts, as we aim to employ and provide further support and training to some of the same people who were trained by the Darwin project (e.g. Amanda Cardoso).

2.3 Outputs

The project outputs relating to capacity building (see Logframe outputs 3 and 4) were mostly met or exceeded, with students successfully gaining qualifications and advancing their careers after the project (see Logframe 4.1). The training of IDEFLOR staff was a notable exception to this: it was not achieved due to the changing nature of our partnership with IDEFLOR following the departure of the director, and the re-alignment of our main project partner to Embrapa. We are convinced that these changes have been beneficial as Embrapa is a much more appropriate partner for engaging with farmers in the Amazon, being one of the most recognised and respected institutions working in the region. Note we succeeded in training 16 young Amazonian scientists in rigorous survey design and interview techniques, during the development of our socio-economic survey team. Most of our interviewers have since gone on to postgraduate training.

Outputs 1 and 2 in the logframe related to understanding fire-use decisions of cattle ranchers and subsistence farmers. We broadened our perspective of these simplistic land-use classes following initial pilot work as many smallholders may have cattle, while many of the largest farms engage in a diverse range of activities and not just cattle farming. We also observed that many of our study landscapes are in a state of transition as many cattle ranchers switch to mechanised arable farming, which in turn influences the fire-use decisions of the surrounding small holders. These transitions form the central focus of the YouTube films, and will be the main focus of a publication led by Dr. Parry that will be submitted in 2014 and analyses the database of 500 interviews with farmers (see logframe 1.1 and 2.1). The neighbourhood effects of the use and impacts of fire on land-use choices by adjacent farmers has also been the focus of work by Thiago Fonseca, a Brazilian PhD student affiliated with the project and based at the University of Sao Paulo. The development of scenarios of the impact of changes in the extent and frequency of wildfires in our study regions (see logframe 1.2 and 2.2) has been presented in international meetings, and will also be submitted for publication in 2014. This work also forms a key component of our contributions towards state and municipality decision making processes regarding forest management and restoration and ecological-economic zoning policies through our engagement with the Municipio Verde program, and will also be presented to farmer's syndicates and civil society groups.

3 Project support to the Conventions (CBD, CMS and/or CITES)

This project aimed to help Brazil meet its CBD commitments by reducing the potential loss of biodiversity caused by forest fires. However, these benefits were not easily measurable during the timescale of this project. Nevertheless, through the network of collaborations and partnerships we have established with public institutions, Brazilian universities and private sector companies (both forestry and agricultural) we are already increasing awareness of the potential costs of fires to Amazonian forests and society at multiple levels.

On the international stage our results have already had an impact at the highest level. The paper by Gardner et al. (Biological Conservation, 2012) drew extensively on experiences within the Amazon throughout the duration of the Darwin project, and was distributed as an official Information Document for the Convention on Biological diversity in Montreal May 2012. The advice provided by this work has had a marked impact on the CBD Secretariat as part of their preparations for international negotiations on this issue, with recognition from a wide variety of respected third party stakeholders. In addition, Gardner, Ferreira and Barlow all contributed to the Global Forest Expert Panel on REDD+, biodiversity, people and forest management that was presented at the Rio Conventions Pavilion in October 2012, at the 11th COP of the Convention of Biological Diversity in Hydrobad, India, and in November 2012 at the COP 18 of the UNFCCC in Doha where it received widespread and positive coverage from the conservation community. The work by Barlow et al. (Biological Conservation, 2012) has made a major contribution to this report, and draws directly on our experiences and understanding of fires developed during the Darwin Project.
The project has led to formal capacity building through the undergraduate and postgraduate students that we have supported and informal capacity building through the dialogue and data collection components of the research that have now been successfully completed. Between August and October 2011 Dr. Gardner worked closely with the CBD as part of the collaborative agreement between the CBD and the International Tropical Timber Organisation (ITTO) to help design a capacity building program for forest management professionals in all eight Amazonian countries. Key aspects of this training program were informed directly by the findings and experiences of work on the Darwin Initiative project.

4 Project Partnerships

Our collaborations with Brazilian institutions have continued to grow, even as the project comes to an end. The legacy of work done through the Darwin project is assured through the development of the Sustainable Amazon Network which now functions as an active learning and research network of researchers and students working on land-sustainability issues in the same study regions.

Our already considerable research network was further consolidated in June 2011 when we organized and ran a three day workshop with partners in Campinas, Brazil (http://saturno.museu-goeldi.br/inct/index.php?option=com_content&view=article&id=98&Itemid=57).

Our relationship with our lead institutional partner, the Goeldi Museum in Belém, Brazil, remains very strong. We have worked closely with our principal Goeldi partner, Dr Ima Vieira the former Director of the museum. Over this reporting period Dr. Vieira has been instrumental prioritizing the fire research agenda in the Brazilian Amazon. Building on our work in agricultural and forestry contexts Dr. Vieira has initiated a complimentary and important research project on the impacts of bio-fuel expansion in Amazonia for fire management and wildfires.

Dr Vieira has also worked tirelessly to maintain and improve links between the Goeldi Museum and the UK. In particular she has led our efforts to participate in Brazil's landmark "Science Without Borders" initiative in which the federal government is investing heavily in international research links and scientific exchanges. To this end, Dr Barlow has received a medium-term (3 years) senior visiting scientist to the Goeldi Museu, furthering our fire research and impact across different sectors in Brazil. This will also involve a funded studentship for a promising Brazilian scientist to undertake their PhD in Lancaster University, in association with the Goeldi Museum. We will begin candidate selection in early 2014. Under this scheme Dr Parry is also

hosting a Brazilian PhD student, Mariana Piva, in Lancaster for the duration of her doctorate studies.

We are particularly pleased that our second key partnership, with the Brazilian federal agricultural research agency, Embrapa, remains very strong. Our lead partner, Dr Joice Ferreira, was instrumental in developing viable links with Amazonian farmers, securing us facilities, and hosting the socio-economic data server during the input stage of the project.

Our partnership with the Federal University of Pará has centred on the MSc courses of our sponsored project students. Since their course has now ended (see below) the frequency of our linkages with UFPA has become less frequent.

Our partnership with the University of Sao Paulo was centred on the doctoral research of Thiago Morello. He adopted Amazonian wildfires as the main theme of this PhD research and has been a crucial member of our research team. We assisted him (and due to his own hard work) in gaining a place on the Latin American and Caribbean Environmental Economics Program. Thiago spent a month in Lancaster University (May 2012) to work on data analysis from our Darwin Initiative fire dataset, and submitted and successfully defended his PhD in 2013.

We have a range of other partnerships with Brazilian institutions, including with the Brazilian National Space Agency (INPE) where we are in the process of developing regional-scale fire risk modelling with Luiz Aragão, as well as with Prof. Silvio Ferraz from the University of São Paulo.

We are in regular contact with leading NGOs in the region, including Imazon and TNC, who share a commitment to improve the management of forests in the Amazon frontier. Imazon are funding a PhD in Lancaster University for their employee, Samia Nunes with support from the Porticus Foundation. Samia started her PhD in May 2012 and is assessing the potential of remote sensing products to explore the interface between wildfires and secondary forest regeneration in human-modified landscapes of the eastern Amazon. Her first publication, assessing the effectiveness of measures to prevent deforestation in riparian forests (Areas of Permanent Preservation), should be submitted in November 2013.

Our work with Tania Cypriano (Viva films, http://www.taniacypriano.com/) successfully produced a series of short films that explore the social and environmental dimensions of slash-and-burn agriculture and transitions to fire-free agriculture in Amazonia (see outputs and logframe). Ms Cypriano worked closely with local film-makers in Santarém to shoot fire scenes and depended heavily on the participation and self-directed filming of rural farmers.

Regular contact has been maintained with our forestry industrial partners, Grupo Orsa (Region 3 in Figure 1). We have shared the research findings of Amanda Estefania with them, although meaningful progress has been difficult as they have been in a period of transition, undergoing significant restructuring of the company following part-sale to an international company in 2012-13. Nonetheless, we have maintained contact with key individuals and are hopeful that Amanda Estefania will use her new role as a professor at the State University of Pará in Altamira to improve the fire avoidance strategies of their smallholder-plantation forestry program.

We have maintained occasional contact with small and large producer organizations in Santarém and Paragominas, and will return to share research findings with funding from the ECOFOR consortium in 2014.

We have strengthened links with researchers working for the French government agricultural agency, CIRAD. Our main colleagues there are Dr Emilie Coudel, an agronomist, and Dr Driss Ezine de Blas, an economist. We are working together on data analysis, focussing on using their skills in understanding farmer compliance with environmental regulations (Coudel) and developing a typology of rural producers (de Blas). This is supporting the Masters studies of Federico Cammelli, which is working with our RAS fire-use data.

We are continuing to work with Dr. José Ferés from the Institute for Applied Economic Research (IPEA) and Dr. Bernardo Strassburg at the International Institute for Sustainability, both in Rio de Janeiro to assess environmental-economic trade-offs and to better understand land-use decisions for the Santarém and Paragominas study regions.

5 Contribution to Darwin Initiative Programme Outputs

5.1 Technical and Scientific achievements and co-operation

The extensive network of collaborators and institutions (developed under the umbrella of the Sustainable Amazon Network and outlined in full in the authorship and institution list of Gardner et al. 2013 publication (Annex 5)) demonstrates the high level of international technical and scientific cooperation in the field of conservation and sustainable use of biological diversity. We have seven publications to date, most of which have been published in high-impact disciplinary and interdisciplinary peer-reviewed journals - we fully expect to publish another 10-15 peer reviewed papers in 2014-15.

5.2 Transfer of knowledge

Knowledge transfer has been undertaken in a variety of different ways. In some of our work, we have taken a bottom up approach where we have used film and workshops to disseminate local ecological knowledge to scientists, other farmers and policy makers (both in English and in Portuguese). Examples of this include the YouTube films and the Carmenta et al. 2013 publication (see Annex 5). Through our collaboration with the Goeldi Museum we also helped produce a promotional and educational video in 2011 to showcase the importance and relevance of the overall work of the Sustainable Amazon Network to the Brazilian public. This video is available on both the Goeldi Museum's website and our own project website (http://www.redeamazoniasustentavel.org/videos/). We have also worked with another collaborative public dissemination project at the Goeldi Museu, called the Escola de Amazonia (Amazon School). We have also disseminated our findings to both globally-relevant policy makers (see section 2.3) and state and municipality level governments (see section 2.2)

5.3 Capacity building

Our main measurable successes in terms of capacity building relate to student development. We are pleased that the students who engaged in the project all successfully submitted their theses. It is even more rewarding, and even more important for the long-term legacy of the project, that many have gone on to follow careers in the areas they developed in the project. For example, Amanda Estefania (who conducted her research in the Jari region) finished her Masters and became a lecturer at a state university in Altamira, and is well placed to pass on her experience to countless other students. Camila Verbicario (who worked in the Santarém-Tapajos study region) is currently planning on undertaking a Masters degree. Heloisa Correa, who conducted semi-structured interviews in fire-use in Santarem and was supported by the Sustainable Amazon Network for preparatory training in Campinas (in English and basic demography) was successful in getting a funded PhD place at the prestigious University of Campinas (UNICAMP). Both Amanda Cardoso and Fatima Almeida, who undertook their undergraduate projects with us in Paragominas, are working on scientific research in Belem, with Fatima holding a full time technicians post at the Goeldi Museum and Amanda holding a 12month stipend related to Jos Barlow's Science without Borders fellowship at the Goeldi Museum. Through the umbrella of the Sustainable Amazon Network our work has engaged representatives of more than 25 Brazilian research and higher education institutions in collaborative publications in international journals, which was a first such experience for many individuals. We invested significant resources and time in collaborations with regional universities that are responsible for training the next generation of professionals engaged in the study and practice of sustainability in the eastern Amazon region, including the Federal University of Pará (UFPA), the Federal University of the West of Pará (UFoPA), and the State University of Pará (UEPA).

Senior project partners also made use of the opportunities presented by the collaborations fostered by the Darwin project to visit and spend extended periods of study in the UK. Dr. Ferreira visited the UK for a year's sabattical, spending time at both Lancaster University (with Barlow and Parry) and the University Cambridge (with Gardner). Dr Viera also visited for a workshop in 2011, together with collaborators from Australia (Drs. MacNally and Thomson) who have helped lead the work on biodiversity mapping and analysis of scenarios of forest degradation from fire.

5.4 Sustainability and Legacy

It is still too early to evaluate the long-term success of the various project achievements, particularly as many of the most policy relevant outputs and publications are still being developed. However, we feel confident that the capacity building will have long-term and enduring success, as evidenced by the remarkable progress of participating students and technicians. In some areas the legacy of capacity building work with research assistants who have no undergraduate education is very marked, for example through the training of field botanists at the Embrapa herbarium as well as parabotanists from the study regions.

Project staff (post-doctoral researchers) based in the UK have all moved on to further their research careers. Dr. Parry is a full time lecturer at Lancaster Environment Centre since November 2011; Toby Gardner is a fellow at the university of Cambridge, and is likely to move to Stockholm Environment Institute; Rachel Carmenta is currently based in CIFOR in Indonesia as a post-doctoral researcher. These researchers have continued to engage in the project and are committed to ongoing efforts to improve sustainable development and biodiversity conservation in the Brazilian Amazon.

6 Lessons learned

Darwin projects are a unique and rewarding funding stream, which are an important part of the UK's commitment to the CBD and other global treaties. They enable academics to engage in activities that would be impossible under research council funding. As such, we hope that they continue long into the future.

However, they are not without their challenges! In general, all projects underestimate the time commitment of project management, and this is especially true when you have multiple partners in different countries. This is complicated in Darwin projects by the relatively modest total budget, which needs to cover 1) the buy out of academic time under full economic costing, 2) the salary of an experienced post-doctoral researcher to help manage and run the project for its duration, whilst 3) leaving enough money left over to actually carry out the field activities and maintain effective partnerships. Unfavourable shifts in the GBP:BR$ exchange rates prior to fieldwork led to further strains on our budget. Without the development of partnerships with complementary projects, and significant matched funding from Brazil (See Section 8.2), we would have only achieved a small fraction of what we managed in this project. Nevertheless, it is also key to recognise that the Darwin Initiative funding was itself instrumental in leveraging this additional funding.

This project taught us about the importance of being adaptive, and not over-reliant on a single partner or a single person in a partnering institution. When Raimunda Monteiro left IDEFLOR, this left us in a weak position in relation to that partnership. However, by being adaptive we were able to capitalise on the growing integration of Embrapa, who turned out to be the most effective partners possible for the project.

One major impediment during the project was the development of a bespoke database to accommodate the results of our detailed social survey that was applied to more than 500 farmers and property holders across the study regions. Database development was first undertaken by a professional consultant, hired by one of our Brazilian partner institutions in April 2011 (before field work had ended). Despite significant investment of time and resources the consultant quit their work, leaving it unfinished in December of 2011. Unfortunately we had to restart the process from scratch, resulting in a significant delay in systematising these data until September 2012 (although stop gap measures meant a number of specific analyses of the social data were already underway by this point and had been presented in international meetings). A greater focus on data management in the application phase may help researchers foresee these issues in the future, and ensure the long-term availability of data from Darwin funded projects.

6.1 Monitoring and evaluation

The use of the logical framework provides a clear and straightforward mechanism for assessing the project against its aims. However, this does assume project managers are familiar with the use of log frames, which are not standard in other aspects of academic grant management (i.e. research council grants). In our case, and despite using these in previous projects, we found that some of the indicators were unrealistic within the time frame of the project. Perhaps two actions could help this: 1) After funding has been announced, it may be desirable to offer assistance to all PI's to re-evaluate the log frame before the project begins. 2) It would be useful to undertake a further round of M&E 2-3 years after the end of project, when more of the outputs and indicators can be evaluated in full.

6.2 Actions taken in response to annual report reviews

n/a

7 Darwin identity

The Darwin logo has been used prominently in all conference talks and workshops. The Darwin Initiative name and grant number is included in the acknowledgements of all academic papers relating from the project, and is clearly linked to the YouTube films http://www.youtube.com/user/slashandburn2013/about and as one of the core funders of the Sustainable Amazon Network http://www.redeamazoniasustentavel.org/partners-funders/

Although the Darwin support formed part of a larger programme with significant funding from other sources, the project has maintained its identity through its focus on fire-related project outputs. This focus has been clearly identified in all project meetings and workshops.

8 Finance and administration

8.1 Project expenditure

Project spend since last annual report	2012/13 Grant (£)	2012/13 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)	XXX	XXX	XXX	
Consultancy costs	XXX	XXX	XXX	
Overhead Costs	XXX	XXX	XXX	
Travel and subsistence	XXX	XXX	XXX	Extra travel to Brazil was needed
Operating Costs	XXX	XXX	XXX	
Capital items (see below)	XXX	XXX	XXX	Correction due to overclaim in year 2
Others (see below)	XXX	XXX	XXX	Extra payment for services to film partner
TOTAL	XXX	XXX	XXX	**Total includes audit fee**

Staff employed (Name and position)	Cost (£)
Toby Gardner 01/04/12 – 31/01/13, Researcher	XXX
Rachel Carmenta 16/12/2012 – 28/02/2013, Researcher	XXX
TOTAL	

Capital items – description	Capital items – cost (£)
TOTAL	

Other items – description	Other items – cost (£)
Payment to film partner Audit Fee	XXX
TOTAL	XXX

8.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
Brazilian National Research Institute "Biodiversity and Land use Change in the Brazilian Amazon" grant to Barlow and Gardner	XXX
Embrapa, "Ecosystem service production in different land-use and agricultural management systems of Amazonia" to Ferreira	XXX
Natural Environment Research Council "Trade-offs between biodiversity conservation and economic development in tropical forests" to Gardner	XXX
British Council "Identifying sustainable land-use and land management options for the Brazilian Amazon" to Gardner	XXX
Brazilian Science Council "Trade-offs between economic development and the conservation of insect biodiversity and associated ecological functions"	XXX
	XXX
TOTAL	XXX

Source of funding for additional work after project lifetime	Total (£)
ECOFOR*	XXX
Science without Borders fellowship to Jos Barlow	XXX
	XXX
TOTAL	XXX

*c. 50% of the ECOFOR money will be used to develop research in the Santarem region of the Brazilian Amazon, and much of this will go to core ECOFOR scientific objectives measuring plant functional traits and carbon cycling. However, at least £30,000 will fund a series of follow up visits with all farmers who collaborated in the Darwin project, allowing us to feedback our findings, further disseminate our film, and gauge responses to the project.

8.3 Value for Money

We believe that our Darwin project delivered exceptional value for money through developing partnerships with other compatible initiatives, through matched Brazilian funding, and through the development of the Sustainable Amazon Network, which had a total spend of over £650,000 and collected unprecedented amounts of social and ecological data in two regions of the Brazilian Amazon (see www.redeamazoniasustentavel.org). The size of the project means we have been slower than anticipated in delivering the high quality outputs, but we believe the benefits of our approach with be clear over the next decade, when the project is seen as a seminal work in our attempt to develop sustainable socio-ecological systems in human modified tropical forest landscapes (see Gardner et al. 2013). Recognition of our work is already evident through invitations to present at international conferences and participate in workshops and seminars. One prominent example of this the invitation for the Sustainable Amazon Network to join the international Program for Ecosystem Change and Society (PECS) as part of the new ICSU global change programmes, while the data collected by the Sustainable Amazon Network will provide the basis for Jos Barlow's keynote address to the forthcoming LBA conference in Manaus, which aspires to set the scientific agenda for the next 10 years (International Workshop on Environmental Modelling in Amazonia, 25-27 November 2013).

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

Note: For projects that commenced after 2012 the terminology used for the logframe was changed to reflect DFID's terminology.

Project summary	Measurable Indicators	Progress and Achievements in the last Financial Year (2012-2013)	Actions required/planned for next period
Goal/Impact: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.			Do not fill not applicable
Purpose/Outcome To reduce the prevalence of Amazonian wildfires by linking earth observation, biodiversity data, and social and ethnographic research with environmental education, training, and capacity building.	Measurable difference in attitudes and agricultural practice after environmental education. Training and capacity building achieved, and project partners able to undertake monitoring and evaluation of impact of environmental education.	We focused on creating a diffuse and broad impact rather than a narrow but deeper impact, making it very difficult to monitor the exact effect of our project on fire-use through assessments of satellite imagery or changes in farmer behaviour. However, there were tangible changes in environmental legislation regarding the value of secondary forests following our policy document that was based on data collected as part of the Darwin project. We met most of our capacity building targets on an individual basis, most notably with post-graduate support. We had less of an impact on an institutional basis, which were more difficult to influence within the time frame	Do not fill not applicable
Output 1.	Change in the attitudes and agricultural practices used by cattle ranchers	The below indicators provide a straightforward and appropriate measure of fieldwork and dissemination activities for cattle ranchers, although in the end this group was difficult to separate from other social groups in output 2. Here we present information for all questionnaires.	

Project summary	Measurable Indicators	Progress and Achievements in the last Financial Year (2012-2013)	Actions required/planned for next period
	1.1 Social and environmental costs of fires are quantified for cattle ranchers	Data from 499 rural properties and 623 households (encompassing cattle ranchers, soy bean farmers and smallholders) across the Santarem and Paragominas landscape has been collected and integrated into a single MySQL database. These data formed the basis of the PhD by Thiago Morello on the use and impacts of fire in slash and burn farming systems in Santarem and Paragominas, and also underpin the interdisciplinary analysis of scenarios for shifting away from slash and burn farming in a high impact paper currently being developed by Parry.	
	1.2 Development of virtual landscape fire scenario package as policy tool.	This has not been developed, as outlined in 2012 annual report. We hope to revisit these issues through a significant modelling component in the ECOFOR project, and we are currently approaching it through the Sustainable Amazon Network, which is already incorporating fire risk into conservation planning exercises for the municipality of Paragominas. This work has been presented at two international meetings and is being prepared for submission to an international journal.	
	1.3 Development of ethnographic film showing the social and environmental costs of wildfires	Five short documentaries uploaded onto YouTube in March 2013, with versions in both Portuguese and English.	
	1.4 Development of Radio documentary demonstrating the social and environmental costs of wildfires	This has not been developed, as outlined in 2012 annual report.	
Output 2.	Change in the attitudes and agricultural practices used by subsistence farmers	The below indicators provide a straightforward and appropriate measure of fieldwork and dissemination activities for subsistence farmers.	
	2.1 Social and environmental costs of fires are quantified for subsistence farmers	Data from 499 rural properties and 623 households (encompassing cattle ranchers, soy bean farmers and smallholders) across the Santarem and Paragominas landscapes has been collected and integrated into a single MySQL database. An additional set of interviews were conducted with 80 subsistence farmers in the Tapajos-Arapiuns Extrractive Reserve and the PAE Lago Grande, as part of Rachel Carmenta's PhD (awarded 2013, publication submitted). A further 39 interviews with subsistence farmers were conducted by Amanda Estefania in the Jari landholding, focussing on	

Project summary	Measurable Indicators	Progress and Achievements in the last Financial Year (2012-2013)	Actions required/planned for next period
		how forestry is altering the fire management. These formed the basis of her MSc thesis (awarded 2012) and this work has been submitted for publication.	
	2.2 Development of virtual landscape fire scenario package	This has not been developed, as outlined in 2012 annual report. We hope to revisit these issues through a significant modelling component in the ECOFOR project, and we are currently approaching it through the Sustainable Amazon Network, which is already incorporating fire risk into conservation planning exercises for the municipality of Paragominas. This work has been presented at two international meetings and is being prepared for submission to an international journal.	
	2.3 Development of film showing the social and environmental costs of wildfires	Five short documentaries uploaded onto youtube in March 2013, with versions in both Portuguese and English.	
	2.4 Development of Radio documentary demonstrating the social and environmental costs of wildfires	This has not been developed, as outlined in 2012 annual report.	
Output 3.	Improved regional capacity to undertake environmental education and awareness programs and the subsequent monitoring and evaluation of their effectiveness.	Our original plans changed considerably given the changes to our key partnerships (Embrapa replaced Idefor as the effective Amazonian partner), and the increased spatial scale of the project led to an increase in the amount of time spent in the field and processing data. Yet we are on course to deliver significant contributions to the development of policy relevant landscape scenarios, and our relationship with local government in Paragominas means we are confident that these can be incorporated into their decision making over the coming 12-24 months.	
	3.1 Field course in Altamira for IDEFLOR staff and students to improve capacity to engage with cattle ranchers.	As outlined in the 2011 and 2012 annual reports, our planned partnership with IDEFLOR did not grow in the way we planned, with our main contact (the director, Raimunda Monteiro) moving on to become vice chancellor of a new university (UFoPA) in Santarem.	

Project summary	Measurable Indicators	Progress and Achievements in the last Financial Year (2012-2013)	Actions required/planned for next period
	3.2 Community-based workshops conducted in Extractive Reserves and establishment of learning portfolio.	We conducted a series of community based workshops in extractive reserve and sustainable use reserves, led by Rachel Carmenta. These contributed to the publication in Human Ecology, outlining mismatch between government rules and local fire practices. This work is being continued by Emilie Coudel (CIRAD) and her masters student Federico Cammelli in the agrarian reform areas of Paragominas.	
	3.3 Training of IDEFLOR staff in (a) techniques that can be used to monitor and evaluate fires, and (b) environmental education techniques, including use of virtual landscape tools	The integration of the project with other large projects run by Embrapa and Cambridge University expanded the geographical scope of our study, but also means that we are significantly behind on the delivery of landscape-wide analysis that develops scenarios regarding different policy options. However, we are pleased that collaboration with scientists in Australia Ralph Mac Nally) and USP Brazil (Silvio Ferraz) has enabled us to develop an analysis that will show priority areas for regeneration and avoided degradation in the Amazon frontier zone, including how the risk of escaped wildfires (and avoided fire) alters the most appropriate option. This has been presented at international conferences (Association of Tropical Biology and Conservation, Brazil, 2012) and we expect a high impact publication in 2014. We will use this as part of our feedback to farmers and policy makers in the region, and Joice Ferreira (Embrapa) has been in frequent contact with the farmer syndicates and regional government in Paragominas.	
	3.4 Integration of a coherent fire policy into certification schemes for cattle ranching.	Following completion of 3.3, we expect to be able to offer our insights to guide the reforestation plan of the municipality of Paragominas.	
Output 4.	4. Improved national capacity to undertake policy relevant social research, and disseminate it effectively	This is one of the easiest indicators to assess, but qualifications tell only a part of the story. The post-project career development of many of the students is particularly pleasing and will be vitally important for Pará's sustainable development. We think the project has made important contributions to the research capacity and profile of the Goeldi Museu, the State University of Pará, and the agricultural agency, Embrapa. Our contributions towards the capacity building of young scientists in Para's regional universities has left a significant legacy with these people continuing successfully in postgraduate education or professional jobs in universities and research institutions.	

Project summary	Measurable Indicators	Progress and Achievements in the last Financial Year (2012-2013)	Actions required/planned for next period
	4.1 Research undertaken and students achieve qualifications	We are very pleased by the quality of the research that our students have undertaken, and many have gone onto to follow careers in the areas they developed in the project. Amanda Estefania finished her Masters and became a lecturer at a state university in Altamira, and is well placed to pass on her experience to countless other students. Camila Verbicario is currently applying to enter a MSc course. Both Amanda Cardoso and Fatima Almeida are working in scientific research in Belem, with Fatima holding a full time technicians post at the Goeldi Museum. Cecilia Viana who worked with the project to coordinate the collection of socio-economic data in Paragominas has continued studies as a PhD student at the University of Brasilia in Sustainable Development. Heloisa Correa has entered into a PhD programme at UNICAMP, one of Latin America's leading universities.	

Annex 2 Project's full logframe, including indicators, means of verification and assumptions

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal: Effective contribution in support of the implementation of the objectives of the Convention on Biological Diversity (CBD), the Convention on Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species (CMS), as well as related targets set by countries rich in biodiversity but constrained in resources.			
Sub-Goal: To help Amazonian countries meet their CBD objectives by reducing the spread of wildfires, thereby minimising biodiversity loss and helping maintain the resilience of tropical forests to climate and land-use change.	A reduction of wildfires, changes in agricultural practice, and an increase in environmental education schemes.	Earth observation data (satellite monitoring of the timing, frequency and location of fires). Monitoring of agricultural practices by Brazilian counterparts (both within governmental institutions, and within local communities).	[redacted]
Purpose: To reduce the prevalence of Amazonian wildfires by linking earth observation, biodiversity data, and social and ethnographic research with environmental education, training, and capacity building.	Measurable difference in attitudes and agricultural practice after environmental education. Training and capacity building achieved, and project partners able to undertake monitoring and evaluation of impact of environmental education.	IDEFLOR (Pará state forestry department) disseminates results, and undertakes monitoring and assessment of the effectiveness of the education program. Community based monitoring is undertaken.	Project partners are able to work together and communicate effectively IDEFLOR has the institutional capacity to implement the dissemination, education, and the monitoring of the results.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Outputs 1. Change in the attitudes and agricultural practices used by cattle ranchers	Social and environmental costs of fires are quantified for cattle ranchers	Data collected and available to partners	Farmers collaborate with social researchers through agreed links (AVISAR)
	Development of virtual landscape fire scenario package as policy tool.	Data compiled into GIS database Publications submitted 3D model developed	Date collected is useful for building virtual landscapes – Virtual Landscape scenarios are interpretable by stakeholders.
	Development of ethnographic film showing the social and environmental costs of wildfires	Film available for dissemination	Farmers and smallholders collaborate with film project
	Development of Radio documentary demonstrating the social and environmental costs of wildfires	Radio documentary available for dissemination	Smallholder communities collaborate with radio project
2. Change in the attitudes and agricultural practices used by subsistence farmers	Social and environmental costs of fires are quantified for subsistence farmers	Data collected and available to partners	Farmers collaborate with social researchers through agreed links (AVISAR)
	Development of virtual landscape fire scenario package	Data compiled into GIS database Publications submitted 3D model developed	Date collected is useful for building virtual landscapes
	Development of film showing the social and environmental costs of wildfires	Film available for dissemination	Smallholder communities collaborate with film project
	Development of Radio documentary demonstrating the social and environmental costs of wildfires	Radio documentary available for dissemination	Smallholder communities collaborate with radio project

Project summary	Measurable Indicators	Means of verification	Important Assumptions
3. Improved regional capacity to undertake environmental education and awareness programs and the subsequent monitoring and evaluation of their effectiveness.	Improved institutional capacity and in local government in the state of Pará (able to plan, undertake and monitor impact of environmental education). The establishment of learning portfolios/networks in communities in fire-prone areas.	State government undertakes education and monitoring program and makes results available. Local communities participate in the project, monitor their activities, and share results. .	State government maintains interest in project Communities are interested, and are willing to undertake monitoring.
4. Improved national capacity to undertake policy relevant social research, and disseminate it effectively	Improved expertise in undertaking social research, and coordinating and undertaking large-scale environmental education programs.	MSc students complete by end of project PhD student finishes by end of project Government and research institutions in Pará state continue to work with INPE (Brazilian space agency) and University of Campinas.	Students are integrated into project structure and complete their course Institutions in Pará and those in the south-east of Brazil are willing to work together.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Activities (details in workplan) 1.1 Social and environmental costs of fires for cattle ranchers assessed 1.2 Virtual landscape fire scenario package developed for regions dominated by cattle ranching 1.3 Production of ethnographic film showing the social and environmental costs of wildfires in regions dominated by cattle ranching 1.4 Production of Radio documentary demonstrating the social and environmental costs of wildfires in regions dominated by cattle ranching 2.1 Social and environmental costs of fires for subsistence farmers assessed 2.2 Virtual landscape fire scenario package developed for regions dominated by subsistence farmers and extractivists 2.3 Production of ethnographic film showing the social and environmental costs of wildfires for subsistence farmers and extractivists 2.4 Production of Radio documentary demonstrating the social and environmental costs of wildfires for subsistence farmers and extractivists 3.1 Field course in Altamira for IDEFLOR staff and students to improve capacity to engage with cattle ranchers. 3.2 Community-based workshops conducted in Extractive Reserves and establishment of learning portfolio. 3.3 Training of IDEFLOR staff in (a) techniques that can be used to monitor and evaluate fires, and (b) environmental education techniques, including use of virtual landscape tools 3.4 Integration of a coherent fire policy into certification schemes for cattle ranching. 4.1 Research undertaken and students achieve qualifications.			
Monitoring activities: Indicators for 1 & 2. Social and environmental research is undertaken, virtual landscape fire scenarios tool is produced, and film and radio outputs are completed. Indicators for 3. Training courses take place and enhance capacity in IDEFLOR. Community-based workshops take place. Indicators for 4. Publications and qualifications available.			

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	30	Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	0	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	0	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	30	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	0	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	40	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	0	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 (e.g. 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)	Details
Training Measures			
1a	Number of people to submit PhD thesis	4	Rachel Carmenta (LU) Thiago Fonseca (USP) Nicola Saveiro (UFPA) Patricia Torres (USP)
1b	Number of PhD qualifications obtained	2	Rachel and Thiago, from above.
2	Number of Masters qualifications obtained	2	Amanda Estefania Carla Furtado
3	Number of other qualifications obtained		
4a	Number of undergraduate students receiving training	2	Amanda Cardoso Fatima Almeida
4b	Number of training weeks provided to undergraduate students	30	
4c	Number of postgraduate students receiving training (not 1-3 above)	3	Cecilia Viana Karoline Goncalves Camila Verbicario
4d	Number of training weeks for postgraduate students	208	Duration of technical support stipend
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)	7	Alessandra dos Santos Douglas Tyminiak Maria Luciane Mota Wendell Rocha Sá Marcio Roberto Cunha dos Santos Jaco Barroso Claudio Nor Cardoso dos Santos
6b	Number of training weeks not leading to formal	8	Training of field assistants named

Code	Description	Totals (plus additional detail as required)	Details
	qualification		under 6a in socio-economic survey techniques
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)	76	Jos Barlow (26), Luke Parry (52), Toby Gardner (8)
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	Secondary forest policy document for Pará state government (Green County Program)
10	Number of formal documents produced to assist work related to species identification, classification and recording.	1	http://www.infoteca.cnptia.embrapa.br/handle/doc/957342 The Sustainable Amazon Network contributed to this programme at Embrapa's herbaria
11a	Number of papers published or accepted for publication in peer reviewed journals	7	See annex below
11b	Number of papers published or accepted for publication elsewherex		
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1	Socio-economic database
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country		
13a	Number of species reference collections established and handed over to host country(s)		
13b	Number of species reference collections enhanced and handed over to host country(s)		

Code	Description	Totals (plus additional detail as required)	Details
Dissemination Measures			
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	5	ATBC Bonito (June 2012), Cambridge workshop(s), Lancaster workshop(s), USP workshops(s), Embrapa/INCT workshop,
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	12	Association of Tropical Biology & Conservation 2012 & 2013, INTECOL 2013, Royal Geographical Society Monday night lecture 2012, Imperial College 2012, Oxford University 2013, St.James's Palace/Royal Society tropical Forest meeting 2013, Univ. Of Manchester 2012, Ecological Society of America annual meeting 2011, CIFOR fire workshop, Pucallpa Peru 2011, British Ecological Society Symposium in Cambridge 2011, BES annual meeting, Leeds 2010.
15a	Number of national press releases or publicity articles in host country(s)		
15b	Number of local press releases or publicity articles in host country(s)	1	O Diario do Pará interview with Joice Ferreira
15c	Number of national press releases or publicity articles in UK	1	Lancaster University http://www.lancaster.ac.uk/sci-tech/news/?article_id=1696
15d	Number of local press releases or publicity articles in UK		
16a	Number of issues of newsletters produced in the host country(s)	2	Regular SAN newsletters to all project participants

Code	Description	Totals (plus additional detail as required)	Details
			and dissemination of fire films on list servers such as http://listserver.ciesin.columbia.edu/cgi-bin/wa?A2=ind1303&L=PERN&P=1639
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	Sustainable Amazon Network
17b	Number of dissemination networks enhanced or extended		
18a	Number of national TV programmes/features in host country(s)		
18b	Number of national TV programme/features in the UK		
18c	Number of local TV programme/features in host country		
18d	Number of local TV programme features in the UK		
19a	Number of national radio interviews/features in host country(s)		
19b	Number of national radio interviews/features in the UK		
19c	Number of local radio interviews/features in host country (s)	1	Joice Ferreira was interviewed on Radio Nacional in Brazil talking about our work on forest degradation
19d	Number of local radio interviews/features in the UK		
Physical Measures			
20	Estimated value (£s) of physical assets handed over to host country(s)	£3000	Video recorders and computing

Code	Description	Totals (plus additional detail as required)	Details
21	Number of permanent educational/training/research facilities or organisation established	0	
22	Number of permanent field plots established	24	0.25ha plots
23	Value of additional resources raised for project (*See Section 8.2 above*)	£645,000	
Other Measures used by the project and not currently including in DI standard measures			

Annex 5 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Journal	Carmenta, R., Vermeylen, S., Parry, L. & Barlow, J., 2013. Shifting cultivation and fire policy: Insights from the brazilian amazon. Human Ecology, 41 (4), 603-614	Springer-Praxis	http://link.springer.com/article/10.1007%2Fs10745-013-9600-1	
Journal	Gardner, T.A., Ferreira, J., Barlow, J., Lees, A.C., Parry, L., Guimaraes Vieira, I.C., Berenguer, E., Abramovay, R., Aleixo, A., Andretti, C., Aragao, L.E.O.C., Araujo, I., De Avila, W.S., Bardgett, R.D., Batistella, M., Begotti, R.A., Beldini, T., De Blas, D.E., Braga, R.F., Braga, D.D.L., De Brito, J.G., De Camargo, P.B., Dos Santos, F.C., De Oliveira, V.C., Nunes Cordeiro, A.C., Cardoso, T.M., De Carvalho, D.R., Castelani, S.A., Mario Chaul, J.C., Cerri, C.E., Costa, F.D.A., Furtado Da Costa, C.D., Coudel, E., Coutinho, A.C., Cunha, D., D'antona, A., Dezincourt, J., Dias-Silva, K., Durigan, M., Dalla Mora Esquerdo, J.C., Feres, J., De Barros Ferraz, S.F., De Melo Ferreira, A.E., Fiorini, A.C., Flores Da Silva, L.V., Frazao, F.S., Garrett, R., Gomes, A.D.S., Goncalves, K.D.S., Guerrero, J.B., Hamada, N., Hughes, R.M., Igliori, D.C., Jesus, E.D.C., Juen, L., Junior, M., De Oliveira Junior, J.M.B., De Oliveira Junior, R.C., Souza Junior, C., Kaufmann, P., Korasaki, V., Leal, C.G., Leitao, R., Lima, N., Lopes Almeida, M.D.F., Lourival, R., Louzada, J., Mac Nally, R., Marchand, S., Maues, M.M., Moreira, F.M.S., Morsello, C., Moura, N., Nessimian, J., Nunes, S., Fonseca Oliveira, V.H., Pardini, R., Pereira, H.C., Pompeu, P.S., Ribas, C.R., Rossetti, F., Schmidt, F.A., Da Silva, R., Viana Martins Da Silva, R.C., Morello	Royal Society	http://rstb.royalsocietypublishing.org/content/368/1619/20120166.abstract	free

	Ramalho Da Silva, T.F., Silveira, J., Siqueira, J.V., De Carvalho, T.S., Solar, R.R.C., Holanda Tancredi, N.S., Thomson, J.R., Torres, P.C., Vaz-De-Mello, F.Z., Stulpen Veiga, R.C., Venturieri, A., Viana, C., Weinhold, D., Zanetti, R. & Zuanon, J., 2013b. A social and ecological assessment of tropical land uses at multiple scales: The sustainable amazon network. Philosophical Transactions of the Royal Society B-Biological Sciences, 368 (1619)			
Journal	Barlow, J., Parry, L., Gardner, T.A., Ferreira, J., Aragao, L.E.O.C., Carmenta, R., Berenguer, E., Vieira, I.C.G., Souza, C. & Cochrane, M.A., 2012b. The critical importance of considering fire in redd+ programs. Biological Conservation, 154, 1-8	Elsevier	http://www.sciencedirect.com/science/article/pii/S0006320712001772	
Journal	Gardner, T.A., Burgess, N.D., Aguilar-Amuchastegui, N., Barlow, J., Berenguer, E., Clements, T., Danielsen, F., Ferreira, J., Foden, W., Kapos, V., Khan, S.M., Lees, A.C., Parry, L., Roman-Cuesta, R.M., Schmitt, C.B., Strange, N., Theilade, I. & Vieira, I.C.G., 2012. A framework for integrating biodiversity concerns into national redd+ programmes. Biological Conservation, 154, 61-71	Elsevier	http://www.sciencedirect.com/science/article/pii/S0006320711004368	free
Journal	Carmenta, R., Parry, L., Blackburn, A., Vermeylen, S. & Barlow, J., 2011. Understanding human-fire interactions in tropical forest regions: A case for interdisciplinary research across the natural and social sciences. Ecology and Society, 16 (1)	The Resilience Alliance.	http://www.ecologyandsociety.org/vol16/iss1/art53/	free
Book chapter	Gardner, T.A. 2013. The Amazon in transition: the challenge of transforming the world's largest tropical forest biome into a sustainable social-ecological system. In Addressing Tipping Points, Eds. O'Riordan, T., Lenton, T., and Christie, I. Oxford University Press.	Oxford University Press		
Editorial	Vieira,I.C.G. and Gardner, T.A. (Eds) (2013). Florestas	Boletin of the Goeldi		free

	secundárias tropicais: ecologia e importância em paisagens antrópicas. Boletim Museu Emilio Goeldi Ciências Naturais, 7, 191-194	Museum		
Films	Amazon slash and burn documentaries, five films on Why Amazonian farmers use fire; How Amazon farmers manage fire; Problems that occur with burn practices; alternatives to present practices; How things can change. These were also published in Portuguese.	Youtube	http://www.youtube.com/user/slashandburn2013	free

Annex 6 Darwin Contacts

Project Leader Details	
Name	Jos Barlow
Role within Darwin Project	PI
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Fax/Skype	
Email	
Partner 1	
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Fax/Skype	
Email	
Partner 2.	
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Role within Darwin Project	Co-I, key Brazilian partner
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Email	
Partner 3	
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Partner 5	
Name	Rachel Carmenta
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