

Darwin Initiative for the Survival of Species

Final Report

Darwin Project Information

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Country	El Salvador
Contractor	Alex Monro, The Natural History Museum
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Acronyms & Abbreviation used in this Report

In order to improve the scanning of the report, and also to save time in it's preparation the following abbreviations have been used:

BAP	Biodiversity Action Plan
BM	Herbarium of The Natural History Museum
BS	National Biodiversity Office
CBD	Convention on Biological Diversity
CENTA	Centro Nacional de Tecnologia Agropecuaria y Forestal
COP	Conference of the Parties of the CBD
DI	Darwin Initiative
FMP	Flora Mesoamericana Project
FUDEMCO	Foundation for Entrepreneurial Community Development
GEF	Global Environmental Facility
GO	Government Organization
GTI	Global Taxonomy Initiative
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
LAGU	Jardín Botánico La Laguna
MARN	Ministerio de Medio Ambiente y Recursos Naturales
MBC	Mesoamerican Biological Corridor
MUNHES	Museo de Historia Nacional de El Salvador
MO	Missouri Botanical Garden
NGO	Non Governmental Organization
NHM	The Natural History Museum, London
PANAVIS	Servicio de Parques Nacionales y Vida Silvestre
SalvaNATURA	Fundación Ecologica de El Salvador
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
UES-Agr	Escuela de Biología, Universidad de El Salvador
UES-Bio	Facultad de Ciencias Agronómicas, Universidad de El Salvador
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
WWW	Worldwide Web

2. Project Background/Rationale

2.1 Project Rationale

El Salvador has 16.3% forest cover, over 65% of which is shade forest for coffee production. Shade forest is therefore the major forest resource for the country. We hoped to exploit the synergy between the biodiversity value of shade coffee forest and the potential for coffee farmers to add value to their product through 'environmentally friendly' premiums. At the same time, we wanted to develop the baseline data and taxonomic capacity needed in El Salvador for the implementation of the country's BAP.

The underlying assumption here is that coffee farmers will have access to a premium price through a scheme, in which the biodiversity value of their crop is a significant criteria. Such a scheme was part of a pilot project funded by the World Bank in 1999 as part of the Rainforest Alliances '*Eco OK*' initiative. This initiative has since been expanded and renamed '*Rainforest Alliance Certified*' product. The Rainforest Alliance's certification scheme falls under their '*Sustainable Agriculture Network*'.

2.2 Project Background

El Salvador covers 21,000 km² on the Pacific coast of Central America, and has a population of 6.2 million, making it the most densely populated country in Latin America. Central America is recognised as a global biodiversity hotspot. Within Central America El Salvador is, by far, the most deforested country. Holdridge (1975) estimated that 99.5% of El Salvador would have been forested prior to human occupation. The vast majority of the country's biodiversity would have been associated with that forest cover. Now only 5.3% remains, with an additional 11% of forest cover in the form of shade agroforest for coffee production.

The loss of so much natural forest suggests that a huge proportion of El Salvador's biodiversity and a number of ecosystem services are at risk. It also means that shade agroforest for coffee has become the major forest resource for the country.

In 1998, the first environmental legislation was passed. In 1999, the *Mesoamerican Biological Corridor (MBC)*, a regional UNDP, UNEP and GTZ funded project, was initiated. This has become the main focus for the conservation of terrestrial biodiversity for El Salvador and shade coffee farms represent a significant component of El Salvador's contribution to the MBC.

El Salvador's Biodiversity Action Plan (BAP), the *Estrategia Nacional de Diversidad Biológica* (1999) identifies the generation of baseline data on the country's biodiversity as its main aim. However the country is ill equipped to meet this aim. Much data, in the form of biological collections, is stored in inappropriate

conditions and remains inaccessible to resource managers, mainly because there insufficient taxonomic capacity to interpret the material/ data. A lack of taxonomic capacity is identified as a serious impediment to the implementation of the country's BAP.

At the date at which the project was being designed, El Salvador was recovering from a protracted civil war and experiencing rapid economic growth. A major consequence of the civil war was to diminish and isolate scientific capacity. The main source of scientific capacity in the biological sciences, the Universidad Nacional de El Salvador, was ransacked and occupied for 18 months by the army. Following the signing of the peace agreement in 1992, few resources have been directed towards restoring that capacity. At the same time, rapid economic development has put great pressure on environmental services.

Since the inception of the project coffee prices have collapsed to their lowest in recorded history. Currently, shade coffee is not economically sustainable and shade farms are under threat of deforestation and conversion to more intensive, biodiversity poor systems, or housing developments.

2.3 Problem that the project aimed to address

We aimed to address the taxonomic impediment to the conservation of El Salvador's biodiversity, specifically in relation to shade coffee forest. A shortage of taxonomic and parataxonomic skills, an underestimation of the importance of taxonomy to biodiversity conservation, and insufficient baseline data or identification tools relating specifically to shade coffee forest meant that this crucial, and threatened, environmental resource was not being adequately evaluated or monitored.

2.4 Identification of project need

2.4.1 Parties involved in identifying project need

The need for this project was identified in 1998 by the Minister for the Environment and Natural Resources of El Salvador, Miguel Araujo Padilla. The specific aims of the project were developed through discussions with the Minister; the CBD focal point, Ernesto Quezada Díaz; the Director of the School of Biological Sciences at the Universidad Nacional de El Salvador, Rafael Vega; the Director of the NGO PROCAFE (and current Minister for Agriculture), Elmer Antonio Milán; the Project Director of the World Bank funded project 'Biodiversidad y Café', Ines María Ortiz and the Director of the La Laguna Botanic Garden, Roberto Escobar Lechuga. In addition a seminar was held in San Salvador in January 1998 attended by ca 50 interested parties, including those listed above.

2.4.2 Evidence for a demand for this work

This can be seen in El Salvador's BAP (priorities I, II & III (p. 163)) and from the letters of support forwarded with the original application. In addition World Bank funded a \$1.2 m pilot project in 1999 whose aim was to develop and promote the certification, production and marketing of El Salvador's coffee as 'biodiversity friendly'. The project, entitled 'Biodiversidad y Café' was designed and managed

by PROCAFE, with the certification component undertaken by SalvaNATURA in association with Rainforest Alliance. It did not contain a taxonomic component, and so represented a very real demand for much of the training, identification tools and baseline data outputs of Darwin Initiative project 162/8/150.

2.4.3 Evidence of commitment from local partners:

This project would not have been possible without the continued and enthusiastic support of our local partners:

Ministerio de Medio Ambiente y Recursos Naturales (MARN):

- provided office space and facilities for the project
- organised and prepared two press conferences for the project
- contributed to the biodiversity techniques training course
- issued collection permits
- provided a vehicle for field work on an ad hoc basis
- disseminated the project poster to schools and NGOs through its environmental education network of NGOs
- disseminated the project identification tools through its environmental awareness and education network
- invited the project leader to participate in the national 'Iniciativas de Coordinación y Sinergia entre las Convenciones Multilaterales Ambientales en la Republica de El Salvador' (Coordination Initiatives and Synergy between the Multilateral Environmental Conventions in force in the Republic of El Salvador) workshop as a national participant.

PROCAFE:

- disseminated the project poster to all its regional offices and to affiliated farms
- disseminated the project identification tools to all its regional offices and to 100 affiliated shade coffee farms
- provided a month of paid time for an entomologist on their technical staff to come to the Natural History Museum (NHM) as a Darwin scholar
- identified and contacted shade coffee farmers interested in collaborating in the project through the provision of field sites for the biodiversity sampling
- provided a vehicle and technician to accompany the project team in the location and establishment of the wasp trap sites
- provided a vehicle and technician to maintain the wasp traps. This involved travelling to each site every two months over a period of 18 months, collecting samples and then sorting these at the PROCAFE laboratory in San Salvador.

Universidad de El Salvador (UES):

- provided a month of paid staff time each, and organised and funded teaching cover for four lecturers to come to the NHM as Darwin scholars
- provided the use of drying facilities for the preparation of botanical specimens
- provided 15 dissecting microscopes and a laboratory for the duration of the biodiversity techniques training course

Jardín Botánico La Laguna (LAGU):

- provided a month of paid staff time each for two curators to come to the

NHM as Darwin scholars

- provided the use of drying facilities for the preparation of botanical specimens
- provided a classroom, teaching facilities and the botanical gardens for the duration of the biodiversity techniques training course
- co-ordinated and organised the shipping of collections from El Salvador to the UK
- co-ordinated and distributed incoming equipment to the recipient project partners, this included processing material through customs
- co-ordinated and distributed publications (including the identification tools) to the project partners
- provided advice on potential collecting localities for the project

SalvaNATURA:

- provided the project with park guards when working in the vicinity of El Imposible National Park
- disseminated the identification tools to 150 coffee farms undergoing the process of certification as 'Eco-OK' under the Rainforest Alliance's 'Sustainable Agriculture Network' in Western El Salvador
- co-organised the DI project symposium 'Café y Biodiversidad'

3. Project Summary

3.1 Project purpose and objectives

The overall purpose was to empower Salvadoran nationals to help El Salvador overcome the taxonomic impediment to the management of its biological diversity, specifically that associated with shade coffee production.

We sought to do this through the following objectives:

1. Develop taxonomic capacity within El Salvador
2. Generate baseline biodiversity data for shade coffee farms in El Salvador
3. Disseminate biodiversity data and identification tools
4. Promote awareness of the biodiversity value of shade coffee farms

3.1.1 Develop taxonomic capacity within El Salvador

3.1.1.1 Develop the taxonomic skills of Salvadoran scientists: to train six Salvadoran scientists at the Natural History Museum in London and in the field in El Salvador. Training in the field will enable local scientists to develop their data collection techniques and enable NHM scientists to informally assess their skills and thereby tailor a training programme for them in the Museum. It will also provide local scientists with access to the field: frequently local scientists do not have the funds or cannot get the necessary permissions to collect within the country. Each Salvadoran scientist will spend a month in London working on collections at the NHM. Here they will have access to world class library facilities and collections and contact with world leaders in their discipline.

3.1.1.2 Annual training course 'Biodiversity Monitoring Techniques': three two-week training courses to be held in San Salvador, the first taking place in May 1999. Initially NHM staff will organise the course aimed at coffee farmers, resource managers, GO, NGO workers policy makers, new scientists and students. Basic training will be in collection techniques; identifying and monitoring biodiversity in coffee forest. In 2000 it will be jointly run and in 2001 Salvadoran scientists run the course.

3.1.1.3 Identification tools: three field guides, to the trees, ferns and Pimplinae wasps of shade coffee farms, will be produced during collecting trips by British and Salvadoran scientists and will be field-tested in 2001/02 prior to their final publication and distribution in 2002.

3.1.1.4 Institutional infrastructural capacity: this will be improved through the provision of capital items, such as microscopes, collections storage facilities etc.

3.1.1.5 Contribute to El Salvador's implementation of it's BAP: through the preparation of a discussion document on enhancing taxonomic capacity to inventory and monitor the biological diversity of El Salvador

3.1.2 Generate baseline biodiversity data for shade coffee farms in El Salvador

3.1.2.1 Collection of baseline data: baseline data for three groups of organisms will be collected from shade coffee farms throughout the country. This data will underpin biodiversity monitoring exercises in the future and form the foundation for the preparation of identification tools.

3.1.2.2 Project database: will be collated from specimens collected during this project and other readily available data (from BM & MO). The data will be available via the Internet as soon as possible and updated in El Salvador. It will feed directly into the BAP and other scientific projects e.g., FMP, MBC.

3.1.3 Disseminate biodiversity data and identification tools

3.1.3.1 Dissemination of biodiversity data to El Salvador and the world: use of the WWW and project web site to disseminate species lists. Deposition of duplicate biological collections to scientific partners in El Salvador.

3.1.3.2 Dissemination of identification tools: to coffee farmers, NGOs, GO agencies, Universities and local scientists within El Salvador. In addition disseminate the identification tools to relevant institutions and researchers throughout Central America.

3.1.3.3 Project symposium / workshop: organise international symposium/workshops to disseminate this and related projects' findings, and bring together researchers in the field.

3.1.3.4 Scientific talks / seminars / papers: disseminate the project findings at national and international meetings.

3.1.4. Promote awareness of the biodiversity value of shade coffee farms

3.1.4.1 Production of project posters: promoting the biodiversity value of shade coffee farms for dissemination throughout El Salvador

3.1.4.2 Talks/ seminars and papers: in El Salvador and at an international level

3.1.4.3 Project web site

3.2 Changes to original objectives or operational plans

The following modifications of the original plan were made:

3.2.1 Objective 3.1.1.1: increased

We were able to use the funds allocated to training Darwin Scholars to train 7 rather than 6 local scientists. This enabled us to train a local scientist, José Miguel Sermeño, to specialise in the collection, sampling, preparation and identification of termites. This was requested in February 2000 and approved by the DI (Valerie Richardson) in March 2000 (Mar. 9).

3.2.2 Objective 3.1.1.2: decreased

We were forced to cancel the third and final Biodiversity Monitoring Techniques training course as a consequence of the long term illness of one of our key collaborators on the course. In response to a request from MARN we replaced this with objective 3.1.1.5. We requested this change in February 2002 and this was approved by DI (Marian Jenner) in the same month (Feb. 5)

3.2.3 Objective 3.1.1.5: additional

We were approached by MARN to assist with the preparation of their Enabling Activities in December 2001. Assistance took the form of: a) an analysis and review of their draft assessment of taxonomic capacity 'Estado actual y Diagnóstico de los Inventarios de los Recursos Biológicos. El Salvador, C. A (Documento de Discusión)' and b) the preparation of two discussion documents 'Assessing and enhancing taxonomic capacity', 'Building El Salvador's Taxonomic capacity' and c) assistance on preparation of workshops on a) and b) and on the prioritisation of biodiversity values. We requested this change in February 2002 and this was approved by DI (Marian Jenner) in the same month (Feb. 5)

3.2.4 Project Schedule

The project schedule was extended until November 2002 to enable the Project Leader to present the project findings at a workshop 'Coffee and Biodiversity' held as part of the Ecological Society of America meeting in August 2002 and the Congreso Latino Americano de Botánica held in Colombia in October 2002.

3.3 Articles under the CBD which best describe the project

The project will assist El Salvador in the implementation of Articles 6, 7, 10, 12 and 13 of the CBD. In addition many of the objectives outlined above will be of relevance to Article 18 'Technical and Scientific Co-operation'. In accordance with the guidance notes in Appendix I duplication has been avoided. The project was also of specific relevance to COP decisions III/10, which endorses SBSTTA Recommendation II/2 which identifies the 'taxonomic impediment' to the implementation of the CBD and recommends the establishment of a Global Taxonomy Initiative (GTI).

When developing our objectives we we sought to use the recommendations provided by the following reports:

- i). report of the DIVERSITAS/Systematics Agenda 2000 Workshop "The Global Taxonomy Initiative: Using Systematic Inventories to meet Country and Regional Needs" (UNEP/CBD/SBSTTA/4/INF/7).
- ii) the GEF-UNDP report 'Country capacity development needs and priorities: regional report for Latin America and the Caribbean' (E.H. Bucher et al., 2000).
- iii) the GTI report: 'Assessment of taxonomy needs in Central America: preliminary report (GTI-SIDA-Swedish Scientific Council-INBio, 2001)

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	Project %	Relevant project output
6. General Measures for Conservation & Sustainable Use	10	Objective: 1e. Outputs: 9, 10i, 10ii, 14aii, 14bviii, 20
7. Identification and Monitoring	40	Objectives: 1c, 2a, 2b Outputs: 10iii, 10iv, 10v, 12ai, 12aii, 12aiii, 12bi, 12bii, 13ai, 13aii, 13aiii, 13bi, 13bii
10. Sustainable Use of Components of Biological Diversity	10	Objectives: 3c, 3d, 4a, 4b Outputs: 7iii, 11bi, 11bii, 11biii
12. Research and Training	30	Objectives: 1a, 1b, 3c Outputs: 6ai, 6aii, 7i, 7ii, 14ai
13. Public Education and Awareness	10	Objectives: 4a, 4b, 4c Outputs: 14bii, 14biv, 14bv, 14bx, 14bxi, 14bxii, 15ai, 15aii, 15aiii, 15aiv, 15av, 15avi, 15c,
Total %	100%	Check % = total 100

3.4 Summary of project success at meeting objectives.

3.4.1 Develop taxonomic capacity within El Salvador

3.4.1.1 Develop the taxonomic skills of Salvadoran scientists:

This objective was fully met. Through economies made to the travel and subsistence costs to this objective we were able to train an additional scientist, José Miguel Sermeño to work on termites. This linked in to a 'spin off' project funded by the Wingate Foundation which focuses on shade coffee soil biodiversity (see section 6.2).

3.4.1.2 Annual training course 'Biodiversity Monitoring Techniques':

This course was a complete success. Participant numbers were adjusted from 30 to 15-20, once we began to plan the course with our collaborators. However both courses were oversubscribed well in advance of the start date. Added value was obtained through the networking, which took place on the course. Contact has been maintained with many of the participants.

3.4.1.3 Identification tools:

We produced identification tools to trees, ferns and Pimplinae wasps in the form of field guides. These were designed to be clear and unambiguous, practical and easy to use. These have been very well received by the target users and the

scientific community in Latin America. 600 copies of the tree and fern guides and 500 copies of the wasp guide were printed. Of the tree and fern guides, 450 were distributed within El Salvador through our network of partners and their own networks, within Latin America there has been considerable demand from Guatemala, Honduras, Mexico, Colombia and Peru. Copies have been lodged with the British Museum.

The guide to trees included substantially more species than initially anticipated. Initially we expected to find ca 100 species, however the final figure was 239. The guide to Pimplinae wasps represents the first publication on this group for El Salvador and included the publication of four species new to science.

3.4.1.4 Institutional infrastructural capacity:

We delivered more infrastructure than laid out in the original proposal. The bulk of the funds was spent on collections storage equipment, collecting equipment and books. Notably we were able to have 16 full size herbarium cabinets made in the country and thereby able to double the storage capacity of the herbarium at UES-Bio.

3.4.1.5 Contribute to El Salvador's implementation of it's BAP:

We produced three reports to MARN which fed directly into the fulfillment of El Salvador's CBD Enabling Activities. These included a critical review of MARN's draft assessment of the state of biodiversity information/ data for El Salvador.

The project also helped to plan and present a workshop on the prioritisation of biodiversity services, required for the preparation of El Salvador's second BAP. This resulted in the preparation of a decision matrix and a prioritised list of biodiversity services.

3.4.2 Generate baseline biodiversity data for shade coffee farms in El Salvador

The project generated a significant volume of high quality, verifiable data on the biological diversity of shade coffee farms. For all four groups this was the first baseline data for shade coffee in El Salvador or Latin America. For Pimplinae wasps and termites this was the first such data for the country.

3.4.2.1 Collection of baseline data:

We collected baseline data for the target organisms, as set out in the project proposal. We were surprised by the high levels of tree (data on 261 species) and Pimplinae (data on 59 species) diversity encountered in shade coffee farms. The Pimplinae collections included four new species to science. In all the project made over 2080 tree and fern collections and 1100 Pimplinae wasp collections.

In addition through the development of a 'spin off' project, lead by David Jones (NHM- Department of Entomology), baseline data for key groups of soil organisms: termites, earthworms, ants and beetles was collected in 2001. This represented the first collection of soil biodiversity data, and the first termite and earthworm collections for El Salvador. The termite identifications have already been completed and the data returned to El Salvador.

Duplicate sets of all collections were returned, with labels, to the relevant Salvadoran institutions. A duplicate set was kept at the NHM and in the case of trees and ferns, duplicate sets of collections were also deposited at the Missouri Botanical Garden.

3.4.2.2 Project database:

Databases for trees, ferns and Pimplinae wasps were generated from the baseline collections made, and an inventory of the national collections in El Salvador. This data is available online from the project web page in the form of species lists and in the case of trees, an online searchable database. In addition copies of the original databases have been deposited with MARN, PROCAFE, UES-Bio, UES-Agr and LAGU.

3.4.3 Disseminate biodiversity data and identification tools

3.4.3.1 Dissemination of biodiversity data to El Salvador and the world:

Species list for ferns, trees, Pimplinae wasps and termites have been placed on the project web pages. The web site receives ca. 500 hits a month, split evenly between the Spanish and English mirror pages. Images from the tree guide, the synonymy, common names and voucher collection numbers are available through a searchable online database.

3.4.3.2 Dissemination of identification tools:

600 copies of the tree and the fern identification guides and 500 copies of Pimplinae wasp identification guide were printed. Currently 11 copies of the tree guide, and 5 copies of the fern and Pimplinae guide remain. 450 copies of the tree and fern guides, and 300 copies of the Pimplinae guide were distributed within El Salvador. The remainder were distributed to relevant organisations throughout the World.

Within El Salvador the guides were disseminated through a number of different distribution networks: PROCAFE (150 copies) distributed guides to coffee farmers throughout the country through its network of regional offices; SalvaNATURA distributed 100 copies to shade coffee farms in western El Salvador undergoing certification as part of the World Bank certification pilot study; 100 copies through MARN environmental education/ awareness network; 50 through the UES bookshop. In addition 25 copies were given to UES-Bio for teaching purposes and 25 copies were distributed to local contacts e.g. the Minister of the Environment, UK Ambassador etc.

3.4.3.3 Project symposium/ workshop:

A two day symposium 'Café y biodiversidad' was held in October 2001, as a side-event at the annual congress of the Sociedad Mesoamericana para la Biología y la Conservación. The event was jointly organised with SalvaNATURA and additional financial support obtained from the IUCN Small Grants Programme. 74 participants from eleven countries attended the symposium at which 13 presentations were made and a short field trip organised.

This was a remarkably successful event, drawing together many leading researchers in the field, from all over Latin America. It was also the first ever international scientific meeting on biodiversity and coffee farms. For most of these researchers, this was the first time that they had met. It also provided an

opportunity for our Salvadoran collaborators to develop links with other researchers from the region. This meeting was followed up in 2002 by a workshop at the Ecological Society of America meeting in Tucson, Arizona.

3.4.3.4 Scientific talks/ seminars/ papers:

The project submitted a scientific paper to the International Journal of Biodiversity Conservation (Oryx) in June 2002. In addition another two papers are in preparation. The first of these is a review and discussion of the biodiversity found in shade coffee farms in El Salvador, on which Alex Monro is first author. The second is a review and discussion of the termite diversity of El Salvador, on which José Miguel Sermeño is first author. These should be submitted by the end of 2003. In the future there will be an additional publication on the soil biodiversity of shade coffee farms, resulting from the Wingate Foundation spin-off project.

More seminars and papers to conferences were presented than agreed in the proposal. Of note are the presentations to the British Association for the Advancement of Science Meeting in 1999, the Congreso de la Sociedad Mesoamericana para la Biología y Conservación, Guatemala City, 1999 and a presentation at an Ecological Society of America workshop in 2002.

3.4.4 Promote awareness of the biodiversity value of shade coffee farms

3.4.4.1 Production of project posters

1000 high quality posters were designed and printed in the UK and distributed within El Salvador by our network of project partners. MARN distributed 400 copies to schools through its environmental education/ awareness unit and PROCAFE distributed 400 copies to coffee farmers through its network of regional offices. 150 copies were distributed by the project at the 2001 Congreso de la Sociedad Mesoamericana para la Biología y Conservación held in San Salvador.

3.4.4.2 Talks/ seminars and news media

A number of talks were given to a range of different audiences, both in and outside of El Salvador. Public lectures were given within the UK through the Royal Botanic Gardens Public Lecture Series, the South London Botanical Society and the University of the Third Age. Within El Salvador participation at the Biodiversity Inventory and Monitoring workshop, organised by MARN, enabled a very influential audience to be directly targeted. This included research leaders, conservation NGO workers and MARN staff with responsibility for planning the first national biodiversity inventory. This was complemented by targeted presentations in the UK, for example to John Battle MP, Foreign Secretary, accompanied by the FCO Desk Officer for Latin America and the Caribbean.

News media coverage of the project matched that proposed in the project schedule. The project developed a contact with the Salvadoran daily, La Prensa Grafica, which resulted in a series of newspaper articles, one of which focused on the role of shade coffee in the conservation of biological diversity. In 1999 an interview on the project objectives and rationale was broadcast by the BBC World

Service. In 2002 a similar interview, including some of the more notable findings, was given to the Australian National Broadcasting Corporation.

3.4.4.3 Project website (www.nhm.ac.uk/coffee)

The project website proved an excellent vehicle for promoting public awareness of the value of shade coffee to the conservation of biological diversity. The website gets ca 500 hits a month from all over the world. The site is mirrored Spanish/English and includes a page on the biodiversity value of shade coffee: <http://www.nhm.ac.uk/botany/coffee/coffeeandbiodiversity1.html>

4. Scientific, Training, and Technical Assessment

4.1 Research

Research took the form of data collection for the following key groups of organisms. The aim was to effectively sample the diversity of organisms in shade coffee farms at a national level. No comparative element was planned. The sampling strategy was different for each group of organisms (with the exception of trees and ferns, soil ants and beetles). This section includes reference to research forming part of the Wingate Foundation project.

4.1.1 Staff

4.1.1.1 Trees & Ferns

Alex Monro (NHM)
Karen Sidwell (NHM)
Jesús Reyes (UES-Bio)
Nohemy Ventura (UES-Bio)
Miguel Renderos (LAGU)
Jorge Monterrosa (LAGU)
Rubén Carballo (LAGU)
Hector Castaneda (LAGU)

4.1.1.2 Pimplinae Wasps

Ian Gauld (NHM)
Alex Monro (NHM)
María Ofelia González (PROCAFE)
Rafael Menjívar (UES-Agr)
Julián Mauricio (UES-Agr)
Ricardo Pérez (UES-Bio)
Henriqueta Ramírez (UES-Bio)

4.1.1.3 Soil Termites, Earthworms, Ants and Beetles

David Jones (NHM)
Alex Monro (NHM)
Mario Menjívar (UES-Agr)
José Miguel Sermeño (UES-Agr)

4.1.2 Methodology

All collections were made under the appropriate collecting permits from the Government of El Salvador (MARN & PANAVIS). Duplicate sets of all collections were deposited with the relevant Salvadoran Institutions.

Trees & Ferns

Trees and ferns were sampled at 23 different shade coffee farms throughout El Salvador. We limited ourselves to collecting for 6 hours at each site. At each site we worked with the farm manager, asking him to locate 'unusual' or 'rare' trees and areas of the farm where the shade management was less intensive. This

enabled us to maximise the proportion of total tree diversity sampled at each site. Sampling took the form of preparing 4 duplicate herbarium specimens of each species new to our list, or whose identity was unclear.

Material was dried and provisionally identified in El Salvador by the whole team. Two duplicate sets were then taken to the NHM where provisional identifications were confirmed by Alex Monro, Miguel Renderos and Jesús Reyes and through the distribution of a duplicate set to specialists in each family.

In addition to sampling in shade coffee farms, the herbaria of LAGU and UES were also inventoried for material that had been collected in shade coffee farms, using the label data of herbarium specimens to identify such material, and the specimen database at the Missouri Botanical Garden, which contains the majority of material collected in Central America, to confirm these identifications.

Pimplinae Wasps

Pimplinae wasps were sampled at 12 sites across El Salvador. Each trap was left in situ for 12 to 18 months. It was emptied of its contents every month and this 'insect jam' sorted for Pimplinae wasps by our partners: María Ofelia González, Rafael Menjívar, Julián Mauricio, Ricardo Pérez and Henriqueta Ramírez. Rafael Menjívar and María Ofelia González then transported the sorted wasps to the NHM, where they identified the material as part of their advanced training programme. Ian Gauld subsequently confirmed these identifications.

Soil Termites, Earthworms, Ants and Beetles

Rapid sampling protocols were used to collect termites, ants, earthworms and beetles from natural forest and three shade coffee sites. The sampling protocol was based on a transect 100 m long x 2 m wide. The transect was divided into 20 sections (each section measuring 2 m x 5 m). In each section, termites and earthworms were collected by digging 12 small soil pits (each pit measured 12 cm x 12 cm x 10 cm depth). Dead wood and leaf litter was also examined. Ants and beetles were collected using the Winkler method (a cloth mesh bag) to extract the animals from soil and litter samples. Fifteen Winkler samples were collected from each site. Approximately three days were needed to complete the sampling at each site.

José Miguel Sermeño and David Jones collected and identified the termite and earthworm specimens, while the Soil Biodiversity Programme at the Natural History Museum, has agreed to identify the ant and beetle specimens. Soil quality was assessed by measuring the following soil properties: cation exchange capacity, pH, bulk density, the amount of organic carbon, and the concentrations of nitrogen, potassium and phosphorus, free aluminium and iron oxides.

4.1.3 Extent of exposure of results to peer review

All identifications were reviewed and or confirmed by world specialists in that taxonomic group. In some instances the specialist was a member of the project team, for example Ian Gauld (NHM). In most instances specialists were located in other institutions. Full lists are given in the introduction to each identification guide, but for example Thelypteridaceae (ferns) were determined by Monica

Ponce at the Darwin Herbarium in Argentina, Inga species by Terry Pennington at RBG Kew and Rubiaceae by Charlotte Taylor of the Missouri Botanical Garden.

4.2 Training

4.2.1 Advanced Training of Salvadoran Scientists

The Darwin Scholars who received advanced training were:

Miguel Renderos (LAGU)
Jesús Reyes (UES-Bio)
Nohemy Ventura (UES-Bio)
Jorge Monterrosa (LAGU)
María Ofelia González (PROCAFE)
Rafael Menjívar (UES-Agr)
José Miguel Sermeño (UES-Agr)

The aim of the training was to provide Salvadoran scientists with 'on the job' training in a well resourced and active global taxonomy centre, the NHM. This would provide access to global collections for their taxonomic group, to one of the best taxonomic libraries in the world and to specialists in their field. It would also enable them to become familiar with the standard of collections infrastructure and management in a world leader in the curation of natural history collection.

4.2.1.1 Selection criteria

Scientists were selected on the basis of their current employment and research experience, the aim being to select candidates who had full-time employment in a taxonomic discipline relevant to this project. Using this criteria we were able to select candidates following an informal interview. In reality there are no full time taxonomists in El Salvador, although a number of Salvadoran scientists have basic α -level taxonomy as a significant component of their job. For example María Ofelia González was employed as an entomologist specialising in control of 'broca', a major pest of coffee plants. In order to do this she had developed good identification skills and was actively involved in developing innovative control measures. Pimplinae wasps, being almost exclusively specialist insect parasitoids, were therefore of particular interest to her.

It was also hoped to use the travel component of the training to develop greater communication and collaboration between our partner organisations. For example there is little if any collaboration between LAGU and UES, despite their complementary collections and roles. Similarly there is little collaboration between UES and PROCAFE despite considerable overlap in the field of crop protection. It is with this aim that we paired up scholars from different partner organisations on their visit to London, where they shared the same apartment and worked as part of a team at the NHM.

4.2.1.2 Content

The advanced training took the form of supervised project work that fed directly into project outputs. Scholars spent a month working at the Museum, where they were encouraged to develop contacts with other staff, to use the libraries and were given a presentation on the curation protocol for their group.

There were four different advanced training projects:

Trees: Jesús Reyes (UES-Bio) and Miguel Renderos (LAGU):

- i) identification of tree collections from shade coffee farms under the supervision of Alex Monro.
- ii) production of a character matrix to enable the production of identification guides and determine the basic guide layout under the supervision of Alex Monro and Diccon Alexander.

Ferns: Nohemy Ventura (UES-Bio) and Jorge Monterrosa (LAGU):

- i) identification of fern collections from shade coffee farms under the supervision of Alex Monro and María Carmen Peña Chocarro.
- ii) production of a character matrix to enable the production of identification guides and determine the basic guide layout under the supervision of Alex Monro and Diccon Alexander.
- iii) learn basic herbarium mounting techniques for use in their own institutions under the supervision of Jenny Smithers.

Pimplinae wasps: María Ofelia González (PROCAFE) and Rafael Menjívar (UES-Agr):

- i) identification of Pimplinae wasp collections under the supervision of Ian Gauld.
- ii) learn basic mounting skills for Pimplinae wasps under the supervision of Sondra Ward.

Termites: José Miguel Sermeño (UES-Agr):

- i) identification of termites under the supervision of David Jones.
- ii) production of a collection of taxonomic literature on Neotropical termites.

4.2.1.3 Assessment

Darwin Scholars were continuously assessed by their supervisor(s). Through daily supervision scholars were assisted with the interpretation of identification keys and some of the technical English terminology.

4.2.1.4 Accreditation

This advanced training was endorsed by UES, the NHM and LAGU.

4.2.2 Annual Training Course 'Biodiversity Monitoring Techniques' (San Salvador)

The idea behind this course was to bring together participants from the diversity of GOs and NGOs involved in and responsible for the management of biological diversity and to familiarise them with some basic concepts and methods in the

collection of biodiversity data. This enabled discussion on the CBD and its principles to be held amongst a broad range of interested parties. Whilst many of the participants would probably not be directly involved in the collection of biodiversity data, their familiarisation with some of the basic methods and information resources will undoubtedly facilitate their role in fulfilling El Salvador's BAP. Attendance was excellent and participation enthusiastic.

4.2.2.1 Selection criteria

Selection was done through two different methods: a) GO and NGO organisations were approached and offered places on the course and b) applicants could apply directly through the project web pages. For logistical reasons we decided to limit participant numbers to 15 per course as this was seen as the maximum number we could safely accompany into the field and also matched the number of microscopes we had at our disposal.

4.2.2.2 Content

The aim of the course was to train participants in the basic skills needed to collect and evaluate biodiversity data, within the context of the CBD and El Salvador's own conservation needs, thereby providing some of the human resources needed to undertake El Salvador's national biodiversity inventory as outlined in the country's BAP.

The following is the timetable for the first training course. This was modified slightly for the second course.

Day 1	Introductions Outline aims of course Talk by national biodiversity adviser Contribution of taxonomy to conservation initiatives Identification keys: theory Identification keys practical
Day 2	Plant collecting techniques: why collect plants, the importance of duplicate collections, equipment needed, different approaches, dealing with collections prior to pressing Insect collecting techniques: why collect insects and why Pimplinae wasps in particular, siting and using a malaise trap, storage of collections Practical: siting and erection of a malaise trap
Day 3	preparation of plant specimens volume of material required, arrangement of specimens prior to drying, theory of drying, equipment required. How to identify ichneumonid wasps Practical: sorting ichneumonids from wasp traps
Day 4	Field trip to Coffee farm to collect plants and visit existing traps Make up presses with plant collections and place in dryer
Day 5	Identification of Pimplinae wasps Practical: identification of Pimplinae , collect samples from traps, sort out ichneumonidae, then identify Pimpline to species

Day 6	free day
Day 7	free day
Day 8	<p>Biodiversity information resources: world-wide network of specialists, WWW resources, collections</p> <p>Fern identification using fieldguide, identify a number of collections from herbarium.</p> <p>Nomenclature and typification</p> <p>Practical: constructing character matrices for producing identification keys</p>
Day 9	<p>Visit to MUNHES collections: molluscs, mammals, birds, insects, plants, fossils</p> <p>Visit to UES collection: plants, insects (Biología and Agronomía)</p>
Day 10	<p>Practical: constructing a character matrix for flowering plants</p> <p>Flowering plant characters</p> <p>Review course collections from dryer</p>

4.2.2.3 Assessment

Participants were not formally assessed at the end of the course. With 3-4 'teachers' on each course there was considerable contact between trainers and participants. This enabled the trainers to identify participants who were not coping, or who were not interested. Only one participant out of a total of 33 was considered to have failed. At the end of the course participants were awarded a certificate of participation. Their picture, name and institution were also placed on the project web page (<http://www.nhm.ac.uk/botany/coffee/courseparticipants1.htm> and <http://www.nhm.ac.uk/botany/coffee/course2000participants1.htm>).

In identification exercises for Pimplinae wasps, students with only a few days training were able to identify over 80% of the specimens to species correctly. A similar exercise conducted with sample trees and ferns resulted in success rates of 80% and 90%.

Assessment of the course by the participants took the form of a discussion between the participants and trainers at the end of each course.

4.2.2.4 Accreditation

The 'Biodiversity Monitoring Techniques' training course was endorsed by MARN, UES, the NHM, LAGU, PROCAFE, SalvaNATURA, PANAVis and the Embassy of the United Kingdom. Participants from the following GO and NGOs attended: PANAVis, PROCAFE, SalvaNATURA, UES-Bio, UES-Agr, LAGU, MUNHES, Fundación Oqueli, ProBioTec and FUEMCO attended.

4.3 Capacity building activities

4.3.1 Promotion of biological collections

An important component of this project was the promotion of biological collections as important sources of biodiversity data and as resources in the inventory and monitoring of biodiversity envisaged in the BAP.

Following discussions with our partners at MARN and UES at the beginning of the project, it became clear that a number of policy makers within MARN and UES had underestimated the importance of the role of biological collections in meeting CBD commitments. The importance of biological collections has been outlined in a series of reports produced by UNDP, GEF and GTI to the COPs, e.g. report of the DIVERSITAS/Systematics Agenda 2000 Workshop "The Global Taxonomy Initiative: Using Systematic Inventories to meet Country and Regional Needs" (UNEP/CBD/SBSTTA/4/INF/7); the GEF-UNDP report 'Country capacity development needs and priorities: regional report for Latin America and the Caribbean' (E.H. Bucher et al., 2000) and the GTI report: 'Assessment of taxonomy needs in Central America: preliminary report (GTI-SIDA-Swedish Scientific Council-INBio, 2001.

The project sought to tackle this by lobbying individual policy makers, e.g. the successive Ministers for the Environment, Miguel Araujo and Ana María Majano, and by leading guided tours of the collections for senior University staff.

4.3.2 Collections infrastructure

- i) we were able to double the capacity of UES herbarium through the ordering and purchasing of 16 new herbarium cabinets
- ii) we facilitated the transfer of a permanent member of staff to the UES herbarium (Jesús Reyes)
- iii) we supplied a dozen insect storage cabinets and basic insect preparation items, such as entomological pins, for UES-Agr and UES-Bio
- iv) we supplied UES-Bio and LAGU with 4 microscopes for the identification of both plant and insect material
- v) we supplied UES-Bio and LAGU with several hundred sheets of Museum grade mounting card, and mounting tape for the preparation of plant specimens.

4.3.3 Collecting equipment

- i) a set (each) of long-arm pruners to UES-Bio and LAGU to facilitate the collection of tree biodiversity data, together with associated plant collecting equipment such as high quality press straps.
- ii) a GPS (each) to UES-Bio, UES-Agr and LAGU.
- iii) two malaise traps (each) to PROCAFE, UES-Agr and a single trap to PANAVIS.

4.3.4 Taxonomic literature

- i) copies of Flora Neotropica to UES-Bio and LAGU.
- ii) complete set of Flora de Nicaragua (2002) to UES-Bio and LAGU.
- iii) 14 manuals to the identification of a diversity of plant and insect groups.

4.3.5 Advice to MARN on enhancing capacity to inventory and monitor the biological diversity of El Salvador

At the request of MARN the project produced three reports, organised a workshop and participated in a MARN organised workshop. All of these formed part of El Salvador's Enabling Activities for the CBD.

i) *Assessing and enhancing taxonomic capacity* , 12pp, A. Monro & D.T. Jones, 2002.

ii) *Comments on: 'Estado actual y diagnóstico de los inventarios de los recursos biológicos. El Salvador C.A.'* 21 pp, A. Monro & D.T. Jones, 2002.

iii) *Building El Salvador's taxonomic capacity: key issues to be addressed at the MARN workshop*, 4pp, A. Monro & D.T. Jones, 2002.

iv) 'Prioritización de los servicios de la diversidad biológica' workshop, organised jointly with the Department of 'Patrimonio Nacional' of MARN

v) Participation and presentation to the workshop: Conferencia Taller de Inventarios y Monitoreo de la Biodiversidad, MARN, San Salvador, 2002. A consultative workshop designed to elicit input from Salvadoran NGOs into the second BAP, as part of El Salvador's Enabling Activities.

5. Project Impacts

5.1 Evidence that project achievements have led to the accomplishment of the project purpose

The rationale behind this project was to exploit the synergy between the biodiversity value of shade coffee forest and the potential for coffee farmers to add value to their product through 'environmentally friendly' premiums. At the same time, we wanted to develop the baseline data and taxonomic capacity needed in El Salvador for the implementation of the country's BAP.

5.1.1 Evidence that the project outputs have developed taxonomic capacity are as follows:

5.1.1.1 New projects are being developed, and existing initiatives have been strengthened, as a result of the project:

UES-Bio

1) *Updating knowledge on plant diversity as a tool in the sustainable development of El Salvador.* This is a project to be developed through 2003 and 2004, the aim of which is to review the state of knowledge on the biodiversity of phytoplankton, macroalgae, mosses, ferns, angiosperms and the ethnobotanical knowledge relating to these groups, across the four regions of El Salvador.

2) *The Masters course in Botany* of the Escuela de Biología has been strengthened through the donation of key literature and through improvements to the herbarium.

UES-Agr

1) *A survey of Isoptera of El Salvador.* As a result of the Wingate Foundation project José Sermeño is developing a guide to the Isoptera of El Salvador. José Sermeño is the only person in El Salvador able to identify termites to genus and species.

2) *The Master degree program of Faculty of Agronomy of the Universidad de El Salvador* has incorporated the identification of Pimplinae and Termites into its curriculum. It has also been strengthened through the donation of key literature, and a portable computer, by this project.

3) *A survey of Pimplinae of El Salvador.* Rafael Menjívar is preparing to undertake a full inventory of the Pimplinae of El Salvador, supported by Ian Gauld of the NHM and Karla Cantarero from Honduras.

LAGU

The Ferns of El Salvador. Jorge Monterrosa is developing a programme of research into the ferns of El Salvador, a group of plants underrepresented in the national collections and whose identification is ill supported.

5.1.1.2 Scientists, farmers and organisations involved in the conservation of biological diversity now have the capacity to monitor and measure the diversity of Trees, Ferns, and Pimplinae wasps and Termites of shade coffee farms, through the identification guides, collections, species lists and the skills acquired by the Darwin scholars

5.1.1.3 32 Salvadorans have acquired or developed data acquisition and interpretation skills and are able to collect tree, fern, Pimplinae wasp and termite biodiversity data, in the field, from national biological collections and through the use of WWW resources.

5.1.2 Evidence that the project outputs have developed biodiversity data

5.1.2.1 Extensive species lists are available on the project web pages: <http://www.nhm.ac.uk/botany/coffee/specieslists.html>

5.1.2.2 Lists for 387 species contained in the published identification guides, which are widely distributed within El Salvador

5.1.2.3 biological collections have been deposited at LAGU, UES-Bio, UES-Agr, CENTA and MUNHES

5.1.2.4 the continued collecting of biodiversity data by Darwin Scholars using collecting equipment supplied by the project

5.1.3 Evidence that project outputs have assisted shade coffee farmers to add value to their product

5.1.3.1 Certification

Certification provides a clear mechanism for shade coffee farmers to exploit the biodiversity value of their coffee to generate added value to their product. A certification scheme, supervised by the Rainforest Alliance in partnership with SalvaNATURA was initiated in 2000, was one of the products of the World Bank project 'Café y biodiversidad'. This scheme enables farmers to obtain a premium for 'Eco-OK' or 'Rainforest Alliance Certified' product. The Rainforest Alliance's certification scheme falls under their 'Sustainable Agriculture Network': <http://www.rainforest-alliance.org/programs/cap/index.html> . To date 5,185 ha of coffee have been certified in Latin America, 1685 ha of which are in El Salvador. Certification in El Salvador began in 2000.

The diversity of native shade trees is one of the criteria for the certification of shade coffee farms. The identification guides produced by this project have underpinned the assessment of biodiversity in the certification process by teams from SalvaNATURA who are responsible the assessment of shade coffee farms as part of the Rainforest Alliance scheme.

The identification guides also enable farmers to assess and monitor the diversity of shade trees within their own farms. Since farmers are obliged to pay for certification themselves, the ability of farmers to monitor and identify the diversity within their own farms will help them to predict whether or not they will meet the certification criteria and therefore decide whether they are ready to begin the certification process.

5.1.3.2 Empowerment through knowledge

The identification guides, web pages, media attention, and project activities mediated by project partners (e.g. PROCAFE) have provided shade coffee farmers with direct and irrefutable evidence of the biodiversity value of their farms. This knowledge places them in a stronger position to lobby national and

international organisations, in an attempt to obtain support during the current coffee crisis.

5.2 Unexpected impacts resulting from project meeting objectives

Development of a loose network of scientists working on issues relating to the biodiversity of shade coffee farms

This has resulted from the project symposium, the distribution of the identification guides and to some extent the follow-up workshop in Tucson in 2002. It includes researchers from Colombia, Costa Rica, El Salvador, Guatemala, Mexico, U.K. and U.S.A. Recently the Instituto de Ecología of the Universidad Autonomas de México has expressed an interest in establishing its own programme of research into the biodiversity and environmental value of shade coffee. They approached this project in 2002, with a view of organising a visit to Mexico to share project findings more fully.

5.3 How has project helped the host country to meet its obligations under the Biodiversity Convention (CBD)

Please also see the table in section 3.3 of this report.

5.3.1 Article 6

- i) produced three reports, jointly organised a workshop and participated in another workshop which contributed to MARN's Enabling Activities to the CBD
- ii) improved inter-agency and -institution communication which should facilitate the implementation of cross-institutional and -agency activities, such as identification and monitoring
- iii) promoted the importance of biological collections as biodiversity data and the role of taxonomy in the CBD, to UES, at a corporate level. UES represents the principal source of taxonomic expertise and of future specialists. It also houses biological collections of national importance.

5.3.2 Article 7:

Developed taxonomic capacity for the assessment and monitoring of biodiversity, a key component of El Salvador's BAP (Article 7). This has been helped by the projects:

- i) production of baseline data for a previously unquantified biodiversity resource
- iii) production of identification guides to three key groups of organisms
- iv) generation of new national reference collections (to Pimplinae wasps and Termites)
- v) expansion of existing national reference collections
- vi) improvement of reference collections infrastructure

5.3.3 Article 10

- i) generated and disseminated data to the Government of El Salvador and interested NGOs (PROCAFE, SalvaNATURA) demonstrating the magnitude of diversity in shade coffee farms, thereby enabling this biodiversity resource to be valorised.

- ii) promoting the value of shade coffee farms as a biodiversity resource to MARN and lobbying the CBD focal point and Office of National Patrimony to make it a high priority within El Salvador's BAP.

5.3.4 Article 12

- i) developed some of the taxonomic skills necessary to underpin the measurement and assessment of biodiversity through an advanced training course for Salvadoran scientists.
- ii) developed and undertook a two-week 'parataxonomy' training course on biodiversity conservation, assessment techniques and skills.
- iii) undertook the necessary laboratory, herbarium and field research to generate data on four key groups of organisms.

5.3.5 Article 13

- i) promoted the biodiversity value of shade coffee farms nation-wide through the production and dissemination of a poster and media interviews.

5.4 Plans or policies by the host institutions resulting directly from project.

5.4.1 Enabling Activities

The project produced three reports, used by the host country in its Enabling Activities. The Enabling Activities were used to plan a national biodiversity inventory, a keystone of El Salvador's BAP.

5.4.2 New research

The local experts trained are beginning new research programmes based on the skills they acquired through the project. Two examples of this are a national inventory of Pimplinae being initiated by Rafael Menjívar and an inventory of termites by José Miguel Sermeño, already well underway through UES-Agri.

5.5 Extent that training has improved local capacity to further biodiversity work in the host country

please see 5.4.2, 5.1.2, 5.1.2.2 & 5.1.2.3

5.5.1 What is the evidence for this?

please see 5.1.2 & 5.4.2

A number of the participants on the Biodiversity Training Course have moved on to new jobs since the end of the course. Examples include Ricardo Ibarra who has left the NGO SalvaNATURA to help plan the national biodiversity inventory at MARN, Enriqueta Ramírez who is helping run a conservation initiative on marine turtles in the east of the country and Marco Antonio Hernández, a medical ethnobotanist, who has produced a key to the families of trees of El Salvador. Another participant, Ricardo Pérez, has gone on to do a Masters degree in bird taxonomy in the USA.

5.6 Impact of project on local collaboration

The project has improved links between UES and LAGU, two institutions traditionally isolated from each other, to the extent that curators from both institutions are now in regular contact with each other. This can be attributed directly to the Advanced Training component of the project.

Communication between MARN and UES-Agr has also been improved with at least personal contact having been established between e.g. members of PANAIS (responsible for National Parks) and researchers.

There was also a relatively close and new collaboration between PROCAFE and UES-Agr. Unfortunately PROCAFE was forced to make half of its technical staff redundant, as a result of the collapse in PROCAFE's revenue, itself a direct consequence of the collapse in the world coffee price.

5.7 Social impact

5.7.1 who has benefited from the project? Has the project had (or is likely to result in) an unexpected positive or negative impact on individuals or local communities?

5.7.1.1 Shade coffee farmers

As a result of the collapse in the price of coffee many coffee farmers are in a dire financial situation. For example, one shade coffee co-operative visited by the project supported 99 farmers, each representing a family. In the year 1999 – 2000 the farm sold 1,724 quintals of coffee at \$48 per quintal, whilst the cost of production (excluding the partner's labour) was \$41 per quintal. This represents a profit of \$12,068 for the whole co-operative, i.e. \$122 profit per family in the year. Colombia and Guatemala have seen deforestation of shade coffee farms, with the trees being sold as fuel or timber, land being sold for development, or abandoning their harvest on the coffee bush, simply in order to service debts on the farms. This is an agricultural crisis without parallel in Latin America, and in such a climate the cost of certification can be prohibitive. Moreover, it is questionable whether the premium provided by the certification scheme will be sufficient to make shade coffee economically sustainable.

The impact of the project in this context is obviously going to be limited. Nevertheless, it has gone some way towards strengthening links between farmers and the organisations which represent them on the one hand and the scientific community on the other, has provided practical, high quality identification tools which can be used by farmers, scientists and certification schemes, and has helped underline the biodiversity value of shade coffee farms at the scientific and government level.

5.7.1.2 The advanced training course was of direct benefit to the Salvadoran scientist participants. They were able to acquire new skills and also make contact with peers outside of Central America.

5.7.1.3 Participants on the biodiversity monitoring techniques training course benefited in a variety of ways. From contacts made on the course, skills acquired, and increased awareness gained in discussions on conservation issues held as

part of the course many participants have gone on to more senior jobs in their field (see 5.5.1).

5.7.1.4 At an institutional level the following GO and NGOs had staff trained through the biodiversity training course: PANAVis, PROCAFE, SalvaNATURA, UES-Bio, UES-Agr, LAGU, MUNHES, Fundación Oquelí, ProBioTec and FUEMCO. In addition:

MARN benefited from the direct input of data and comment into the planning stage of the national inventory of biodiversity. Products from the project, in particular the identification guides, have been widely promoted by the Salvadoran government at regional and international CBD COP meetings.

UES benefited from the donation of many taxonomic books, improved collections infrastructure, specialised research equipment, the expansion of its existing collections and the generation of completely new collections.

LAGU benefited from the donation of many taxonomic books, specialised research and curation equipment and the expansion of its existing collections.

PROCAFE benefited from the expansion of its existing collections and the generation of completely new collections. Through the distribution of project identification guides and the project poster it was also able to strengthen its reputation as a source of technical support to shade coffee farmers. This is particularly important at the present time because of the damage done to the NGO by the collapse in the price of coffee.¹

SalvaNATURA benefited from the use and distribution of the project guides to shade coffee farms. This has facilitated and improved the quality of the certification process.

NHM has benefited through the enhancement of its own biological collections, through the experience gained by its own staff on the project and has used the project as a flagship for its contribution to the conservation of biodiversity. The project leader gained immeasurable experience in the realities of biodiversity conservation and sustainable development from this project, made many good friends, broadened his botanical and entomological knowledge and learnt a third language.

The Darwin Initiative gained a number of images that have been liberally used in its project pages and in its promotional leaflet.

¹ PROCAFE was established by the USAID at the end of the war and benefits from a funding arrangement linked to the number of sacks of coffee exported. Farmers are currently refusing to pay their 'dues' as they are barely breaking even at the current coffee price. In a growing number of instances crops have been abandoned on the coffee bushes in order to avoid making a loss harvesting and processing.

6. Project Outputs

See Appendix II for table of actual outputs against those in the agreed schedule

6.1 Outputs not achieved or only partly achieved

output code output target achieved

6a	Number of people receiving other forms of short-term education/training (i.e not categories 1-5 above)	ii) 60	ii) 33 local resource managers, NGO workers and undergraduate students attended the project's biodiversity training course (there is an overlap of 10 students with output 4a)
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Participant numbers were adjusted to the 12-15 mark, instead of the 30 in the project proposal. The reasons for this adjustment in numbers were three-fold: a) we wanted to maximise contact time between students and teachers; b) some parts of the course used equipment e.g. microscopes, which was not as readily available as anticipated at the planning stage and c) we decided to include a number of field trips to shade coffee farms in the course timetable and for health and safety reasons, this also limited participant numbers.

11a	Number of papers published or accepted for publication in peer reviewed journals	3	1 paper submitted to International Journal of Biodiversity Conservation
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We were over-optimistic about the time it would take to put together, submit and have papers accepted for publication. I am however confident that an additional two papers will be published in the coming two years. These are both in preparation. One is an analysis of the biodiversity of Salvadoran shade coffee farms, identifying the proportion of local diversity present in farms. The second paper will be an inventory of the termites of El Salvador.

6.2 Additional outputs achieved

6a	Number of people receiving other forms of short-term education/training (i.e not categories 1-5 above)	6	i) 7 local scientists (3 university lecturers, 2 researchers and 2 curators). Each spent 1 month at the NHM developing taxonomic skills.
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7	Number of types of training materials produced for use by host country(s)	3	5: i) 3 Identification guides ii) 1 Course manual iii) 1 symposium volume
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13 b	Number of species reference collections enhanced and handed over to host country(s)	3	5: i) 2 Vascular plant collections: LAGU & UES (Escuela de Biología) ii) 3 Hymenoptera collections of UES (Facultad de Agronomía), MUNHES, CENTA
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14 b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	3	12 presentations i) Systematics Association, Glasgow, 1999 ii) British Association for the Advancement of Science, Science Festival, Sheffield, 1999 iii) Congreso de la Sociedad Mesoamericana para la Biología y la Conservación, Guatemala City, 1999 iv) South London Botanical Society Lecture Series, London, 2000 v) Royal Botanic Gardens, Kew, Public Lecture Series, London, 2000 vi) Annual project workshop for World Bank project in association with PROCAFE, 'Café y Biodiversidad' San Salvador, 2001 vii) Biodiversidad y Café Symposium, San Salvador, 2001 viii) Conferencia Taller de Inventarios y Monitoreo de la Biodiversidad, MARN, San Salvador, 2002 ix) Ecological Society of America, Coffee and biodiversity workshop, Tucson, 2002 x) project presentation to UK Foreign Secretary of State, John Battle MP, October 2000 xi) project presentation to Lady Kleinwort, October 2001 xii) project field visit by Her Majesty's Ambassador to El Salvador, His Excellency Patrick Morgan, December 2001
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20	Estimated value (£s) of physical assets handed over to host country(s)	12,000	£21,003.14
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6.2.1 Wingate Foundation Project

In collaboration with this project David Jones of the Department of Entomology at

the NHM was able to obtain funds from the Wingate Foundation and the UK Embassy to study termite, soil beetle and soil ant diversity in shade coffee farms in El Salvador. The contribution of this project was to integrate the training of a Salvadoran scientist at the NHM and the purchasing of equipment with both projects. Whilst this was a distinct research project it would not have been viable without this integration. The value of funding for this project was £10,000.

The aim of this study was to measure the diversity of termites, earthworms, ants and beetles, along an agroforestry gradient from natural forest, to three sites with increasing density of coffee bushes and a decreasing amount of shade tree cover. The results will contribute to management policies that help promote sustainable coffee production, maintain forest cover and conserve biodiversity

6.3 Dissemination of information relating to project outputs

Through press conferences, at presentations at scientific meetings in El Salvador and in future scientific publications. Project annual reports and this report, which have been and will be distributed to all partner organisations: MARN, UES-Bio, UES-Agr, PROCAFE, LAGU, SalvaNATURA, NHM. In addition information on the principal outputs will be disseminated through the WWW. The project leader will update these pages.

7. Project Expenditure

7.1 Agreed changes to the budget

All categories of project expenditure were changed on several occasions, with the agreement of the DI. A copy of the correspondence in which these changes were requested, all of which were approved, is included as appendix IV (hard copy version only)

7.2 Variation in expenditure where this is +/- 10% of the budget:

Postage, telephone and stationery -17.3%

Postage costs were greatly reduced by the ability to have the project publications, 2000 units in all, printed in El Salvador, so that only copies for international distribution needed to be shipped to the UK. We were also able to save considerably on the shipping costs for collections made, through an existing agreement between one of our partners, LAGU, and a shipping company, COMARCA.

Travel & subsistence -13.1%

Karen Sidwell, joint project leader, resigned from the NHM in 1999. The remaining project leader spent twice as much time in the field than initially anticipated, resulting in savings in return air travel.

Printing +27%

This can be accounted for by the production of an additional publication: a volume of expanded versions of the symposium presentation. This increased printing and production costs.

Capital +16.4%

We decided to re-direct any saving made elsewhere towards capital items, mainly in the form of collecting equipment e.g. malaise traps, Winkler traps (ca £1000), GPSs and collections processing materials e.g. glass tubes and entomological pins. This enabled the project to collaborate with the Wingate Foundation project (see section 6.2)

8. Project Operation and Partnerships

8.1 Local partners

Six partners worked on the project:

MARN
LAGU
PROCAFE
UES
SalvaNATURA
PANAVIS (were incorporated into MARN during 2001)

This is the same number of partners as identified in the original proposal. SalvaNATURA was not included in the original proposal, but became increasingly involved as a result of their role in the certification of shade coffee farms.

MUNHES were included in the original proposal, however by the time the project began the Museum had been temporarily closed. The main infrastructure of MUNHES was condemned and the building evacuated, due to its dilapidated state. The collections were, in large part 'mothballed' and the status of the researchers unclear. It was however possible to access the collections as part of the project 'biodiversity training course'.

8.2 Main partners and their role in biodiversity issues

MARN. The GO responsible for El Salvador's compliance with the CBD. Both the CBD and GEF focal points are located in MARN. MARN is also responsible for the preparation and coordination of the BAPs, and the application of environmental legislation.

LAGU. The only Botanic Garden in El Salvador and very popular with local people. It works closely with MARN in the preparation of botanical inventory data. It is currently involved in the botanical inventory of the only National Parks of over 1000 ha in size. These are the El Imposible National Park and the Montecristo National Park. LAGU also holds the most modern herbarium in the country with all of its collections databased.

PROCAFE. Established with USAID funding in 1992, PROCAFE is the main NGO offering technical advice to coffee farmers in El Salvador. It was the lead agency in the World Bank 'Café y biodiversidad' project which sought to pilot the certification of shade coffee in El Salvador. PROCAFE has a network of regional offices, each in contact with a significant proportion of the shade coffee farms in that particular region.

UES. The principal source of taxonomic expertise in El Salvador. The Escuela de Biología holds important historical collections of plants (ca 1/3 of which were destroyed during the war). A minority of the botanical collections were databased by the project's end. Its entomological collections were heavily plundered (mainly for butterflies) during the war and have remained in a poor condition since. The Facultad de Agronomía, Protección Vegetal currently holds the most significant entomological collections at UES. CENTA, part of MAG, holds what are probably the most complete collections of insects in El Salvador. There are however no

entomologists currently working at CENTA.

SalvaNATURA. The main environmental NGO in El Salvador. SalvaNATURA is heavily involved in the promotion of many environmental issues, such as deforestation, water conservation and the promotion of El Salvador's National Parks. It is also the main contractor in the certification of shade coffee farms in El Salvador. This it does in association with Rainforest Alliance. SalvaNATURA is also responsible for the management and funding of the El Imposible National Park.

PANAVIS (were incorporated into MARN during 2001). This GO is responsible for overseeing the management of El Salvador's National Parks. It is also responsible for the issuing of permission to use living resources. For example, forest clearance, mangrove clearance or the making of biological collections are all regulated by PANAVIS. PANAVIS is also directly responsible for the management of the Montecristo National Park.

8.3 Partner involvement in project planning and implementation in El Salvador

MARN

- provided office space and facilities for the project
- organised and prepared two press conferences for the project
- contributed to the biodiversity techniques training course
- issued collection permits
- provided a vehicle for field work on an adhoc basis
- disseminated the project poster to schools and NGOs through its environmental education network of NGOs
- disseminated the project identification tools through its environmental awareness and education network
- invited the project leader to attend the national 'Iniciativas de Coordinación y Sinergia entre las Convenciones Multilaterales Ambientales en la Republica de El Salvador' workshop.

PROCAFE

- dissemination of the project poster to all its regional offices and to affiliated farms
- dissemination of the project identification tools to all its regional offices and to 100 affiliated shade coffee farms
- provided a month of paid time for an entomologist on their technical staff to come to the Natural History Museum (NHM) as a Darwin scholar
- identified and contacted shade coffee farmers interested in collaborating in the project through the provision of field sites for the biodiversity sampling
- provided a vehicle and technician to accompany the project team in the location and establishment of the wasp trap sites
- provided a vehicle and technician to maintain the wasp traps. This involved travelling to each site every two months over a period of 18 months, collecting and samples and then sorting these at the PROCAFE laboratory in San Salvador.

UES

- provided a month of paid time staff time each, and organised and funded teaching cover for four lecturers, to come to the NHM as Darwin scholars
- provided the use of drying facilities for the preparation of botanical specimens
- provided 15 dissecting microscopes and a laboratory for the duration of the biodiversity techniques training course

LAGU

- provided a month of paid time staff time each for two curators to come to the NHM as Darwin scholars
- provided the use of drying facilities for the preparation of botanical specimens
- provided a classroom, teaching facilities and the botanical gardens for the duration of the biodiversity techniques training course
- co-ordinated and organised the shipping of collections from El Salvador to the UK
- co-ordinated and distributed incoming equipment to the recipient project partners, this included processing material through customs
- co-ordinated and distributed the distribution of publications (including the identification tools) to the project partners
- provided advice on potential collecting localities for the project

SalvaNATURA

- provided the project with park guards when working in the vicinity of El Imposible National Park
- disseminated the identification tools to 150 coffee farms undergoing the process of certification in Western El Salvador
- co-organised the DI project symposium 'Café y Biodiversidad'

PANAVIS

- provided collection permits for all project collections.

8.4 Modification of project plans in response to local consultation

The idea for this project came from the Minister of the Environment, Miguel Araujo, in discussion with Alex Monro and Karen Sidwell (NHM). The structure of the project was designed in discussions with all of the project partners. There was therefore little subsequent modification of the project in response to local consultation.

8.5 Collaboration with BS and other projects in El Salvador

The main project contact in El Salvador, Jorge Quezada, is the CBD focal point for El Salvador. He is also jointly responsible for the production and application of the country's BAP. There was therefore regular and close contact with this office.

This project worked in collaboration with the World Bank 'Café y biodiversidad'. There was regular contact with the project leader and staff. The DI project attended project meetings and undertook joint field visits. The data collected as part of the DI project was used by World Bank project and the DI project poster

image used as the front cover of the project's guide to the biodiversity friendly production of coffee, published in 2001, '*Guía para la producción de café bajo sombra amigable con la biodiversidad*'.

8.6 Activity of local partnerships after the end of the Project

Partnerships between the NHM and partners are still active after the end of the project. Partnerships between LAGU and UES, and between PROCAFE and UES-Bio have also continued. These have taken the form of participation in consultation exercises, as well as the development of small scale research projects, for example the continued inventoring of termite diversity in El Salvador.

8.7 Need for increased community and private sector participation in conservation of biological diversity associated with shade coffee

As outlined above, shade coffee production in El Salvador, as elsewhere, is in crisis. Community participation, although valuable, will not be able to increase the price of coffee on the world market. There is however a major role for the private sector in the marketing and promotion of shade coffee, both within El Salvador, and internationally. This has not been forthcoming. This project has contacted both the International Coffee Organization and the local representative agency in El Salvador, the Consejo Nacional de Café. This has yielded no results. The project has been approached by a number of local growers, asking for contact with the speciality coffee market abroad. The project web pages provide a number of relevant contact addresses.

There may also be potential for ecotourism initiatives on the farms themselves, many of which are beautiful and full of birds and other wildlife

9. Monitoring and Evaluation, Lesson learning

9.1 Monitoring and evaluation strategy

The strategy adopted was that outlined in the original project proposal:

'This project will be monitored in several ways:

- *The project as a whole will be monitored by the NHM internal project assessment system.*
- *Each objective of the project will be broken down into a number of targets, and the attainment of these monitored on a 6-monthly basis by the project team (both in the UK and in El Salvador).*
- *All NHM staff involved in this project will be monitored by the NHM annual performance review process, which is firmly objective based.*
- *Financial administration will be monitored by the NHM Finance Division.*
- *Scientific publications resulting from work carried out during the project will be published in international peer-reviewed journals, while field guides will be tested in the field by non-specialists prior to publication.*
- *Regular two-way communication by fax, email, phone and letter, between the collaborating parties .*

The end of project audit by the National Audit Office.'

9.2 Internal and external evaluation of project outputs

9.2.1 Species identifications

The majority of the plant and insect identifications were confirmed by specialists in each plant family. This represented 19 specialists for the tree identifications, four for the fern identifications and one for the insect identifications.

9.2.2 Consultation on identification guides

Draft versions of the identification guides were sent to Salvadoran scientists and scientific peers. This enabled evaluations and suggestions to be made prior to publication.

9.2.3 Peer review of articles submitted to journals

Scientific papers have and will be subject to peer-review by Journal editors.

9.3 Key lessons to be drawn from the experience of this project?

9.3.2 DI Project support from UK Government Departments

The DI is an explicit commitment made by the UK Government as part of its fulfilment of the CBD. In fact the DI is mentioned in the Convention text. However there seems little co-ordination of the DI with DFID or FCO initiatives, both of which target funds at the conservation of biological diversity, amongst other aims. It may be worth considering the possibility of using some DI projects as 'pump primers' for future DFID initiatives or promoting DI projects to other UK Government Departments.

9.3.1 Follow on funding

Project legacies could be strengthened through follow up funds which could be aimed at addressing opportunities that have arisen during the course of, or as a

result of the project. For example, during the course of this project we identified a number of gifted students whom we would very much have liked to be able to support to do an MSc in environmental management or taxonomy in the UK. Similarly our identification guides were all very well received and are already out of print. It would be fairly economical to re-print or produce second editions of these guides.

Would the DI consider distributing follow-up funding for projects through dedicated themes, that is, a fund open to DI projects for three years after their termination. For example, a training fund could be established which could support overseas students to study in the UK or abroad.

9.3.2 Targeting the Global Taxonomy Initiative (GTI)

The UK represents a global centre for taxonomic expertise and data. For many groups of organisms it is unparalleled, e.g. in the case of insects. The lack of taxonomic expertise and data has long been recognised as a serious impediment to the conservation of biodiversity, culminating in the ratification of the GTI by the COP (decision III/10). Given the limited funding of the DI, placing more emphasis on projects directly aimed at overcoming the taxonomic impediment may enable the DI to have a greater, more consolidated impact on the conservation of biodiversity at a global level.

9.3.3 Targeting CBD theme work programmes

The CBD has work programmes for each thematic programme, e.g. the <http://www.biodiv.org/programmes/areas/agro/programme.asp>. Co-ordinating DI funding with these programmes, would provide a vehicle for increasing the impact of project legacies. This would happen because projects could be timed to finish at a point in the theme's work programme schedule that would place them in a good position to attract funds through the GEF or GOs.

9.3.4 Scope of Darwin projects

Given the scale of funding, the DI mainly represents small to medium scale projects (i.e. less than \$1m), like this one. Conservation initiatives depend on a broad range of factors: scientific, social, economic, legislative. It is not realistic for a DI project to incorporate, or attempt to incorporate all of these factors. Looking at projects that have been funded in the past, including this one, I feel that 'more' is seen as better. Often the DI Committee would do well to emphasise specific project targets, maybe even suggesting more modest goals.

9.3.6 Administrative burden

In comparison with the scientific research councils or private trusts (e.g. Leverhulme) the average DI project's administrative burden is high. For example the annual reports can easily reach 20-30 pages if completed as requested. It is difficult to see that the consultants hired to review such reports will have enough time to review and check the content of such reports. The monitoring process by DI could also benefit from more direct communication between consultants and project leaders, with reviewers contacting leaders by phone or email with specific queries. During the course of this project I have had no such contact.

10. Darwin Identity

10.1 Publicising the Darwin Initiative

10.1.1 Used Darwin logo on: all publications, including 1000 poster prints; all books and equipment bought for partner institutions, including the herbarium cabinets in UES-Bio and course materials.

10.1.2 Made reference to Darwin Initiative on all collection labels, including duplicate sets of plants sent out to institutions in Mexico and USA.

10.1.3 Distributed copies of Darwin Annual Report to partner organisations in project, including the Minister of the Environment.

10.1.4 Darwin Scholars were referred to as such within the project, all attendees of the biodiversity training course were issued with a certificate which used the Darwin Initiative title and logo.

10.2 Understanding of Darwin Identity in the host country

The Darwin identity is strongly linked to this project. It is well known that this initiative is a UK Government initiative and not an NGO. It is also clearly understood that it relates to the conservation of biodiversity.

10.3 Those in the host country likely to be familiar with the Darwin Initiative

All of the project partners, all those trained on the biodiversity training course, the shade coffee farmers who received the identification guides. Those in MARN who helped plan and co-ordinate the project will be particularly aware of the initiative.

10.4 The project in the context of biodiversity conservation in El Salvador

The project was seen as a distinct initiative. One whose outputs helped to support the legacy of a World Bank 'Café y biodiversidad' project, as well as El Salvador's BAP. This project was commonly referred to as the 'Iniciativa Darwin' and collaboration with El Salvador's BAP and the World Bank project was on the basis of our project providing specialist advice and the mutual sharing of information and results where requested.

11. Leverage

11.1 Additional funds attracted to biodiversity work associated with the project

UES: transfer of Jesús Reyes to herbarium and taxonomic work. This represents the addition of a full-time, permanent member of staff to the herbarium at UES-Bio.

Collaboration with David Jones (NHM-Entomology) to obtain funding from Wingate Foundation and HM Ambassador to El Salvador (a total of £10,000).

11.2 Efforts made by UK project staff to strengthen the capacity of partners to secure further funds for similar work in the host country

11.2.1 I regularly circulate information on funding initiatives to project partners in El Salvador. Information, circulated within the NHM by our Science Marketing Department, is also forwarded where relevant.

11.2.2 I have encouraged MARN (and in particular El Salvador's CBD Focal Point) to develop a proposal for funding to GEF using GTI criteria.

11.2.3 I have encouraged our partners at UES-Bio, UES-Agr and LAGU to develop project proposals, both in collaboration with the NHM, or other overseas partners. I have also offered to comment on and help locate funding sources for these projects. I am not however in a position, nor do I feel that it would be appropriate, to lead new research projects.

11.2.4 I have contacted the NHM's Science Marketing Department (responsible for locating grants) with a view to getting funds to continue the biodiversity training course, pay for a Salvadoran student to do a Masters degree in Environmental Technology, and to print a second edition of our identification guide. To date they have been unable to identify appropriate funding sources.

12. Sustainability and Legacy

12.1 Project achievements most likely to endure

12.1.1 Identification guides.

The guides have been designed to be used by non-specialists and are in Spanish. They probably represent the most accessible information on the biological diversity associated with coffee shade forest, to date. All guides were widely distributed within El Salvador and should remain current and in use for decades to come.

12.1.2 Biodiversity data.

This is readily available through the WWW, is published within El Salvador as appendices or tables in the identification guides, and will be published in an international peer reviewed journal within the next two years. This data will feed into El Salvador's BAP and is available to the decision making process.

The collections themselves should last 100-200 years (plants), ca 50 years (Pimplinae wasps) and ca 100-200 years (termites), considering current collections storage infrastructure in the institutions concerned.

12.1.3 Training of Darwin Scholars.

Of the seven Darwin Scholars who received training at the NHM, five remain in permanent employment in the natural sciences. They have all since initiated new research programmes of their own, in part, or entirely as a result of their training (see 5.1.2.1). Although it is difficult to predict the success of these research programmes, at the very least they will continue for several years.

In addition, four of the Darwin Scholars are Professors (the equivalent of lecturers in the UK) and have incorporated their new skills into their teaching programmes. For example UES-Agr has now introduced modules on Pimplinae and Termite identification into the entomological component of the Crop Protection degree and masters course.

12.1.4 Collections infrastructure.

12.1.4.1 Plant collections (herbaria) (see 4.3.2). The supply of herbarium cabinets and materials for mounting plant collections (conservation grade rag paper, glue and training in the mounting of collections) has provided both national herbaria with room for expansion and the skills and infrastructure to maintain their collections for a considerable length of time. The purchasing of the Flora de Nicaragua and other taxonomic reference works has also enabled the curators to bring improve the accuracy of identification, and thereby increase the value of their collections.

12.1.4.2 Insect collections (see 4.3.2). The supply of museum grade entomological boxes, pins and glass vials should significantly extend the life of existing entomological collections and enable the correct storage of material that needs to be stored in alcohol. The supply of glass vials and pins will facilitate the expansion of the collections for several years to come. In particular it will underpin the development of a comprehensive termite collection which is already well underway.

12.1.4.3 Collecting infrastructure (see 4.3.3)

Both herbaria were supplied with basic plant collecting equipment. This included

12 m long-arm pruners, press straps, blotting paper and a GPS. All of this equipment should last several years and underpin the future collection programmes of many initiatives related to the BAP and each institution's own research programme, e.g. the botanical inventory of national parks and the Mesoamerican Biological Corridor. UES-Agr and PROCAFE were provided with malaise traps which are standard trapping equipment for flying insects.

12.1.5 Biodiversity training course.

The participants in the biodiversity training course represent a resource potential. Not simply as people with the ability to collect, prepare and preliminarily identify biological collections, but also as people with an awareness of the biodiversity resources available at a national and international level. This potential is likely to be realised during 2003, with the initiation of the national biodiversity inventory.

12.1.6 Awareness of biodiversity value of shade coffee farms.

Through the publication of the identification guides, project posters, web page, training courses, seminars, symposium and associated media coverage there is now a greater awareness, amongst GOs and NGOs of the extent of the biological diversity associated with shade coffee production in El Salvador. Although there was a general awareness of the diversity of birds in shade coffee farms, there was very little awareness of the diversity of trees, ferns, Pimplinae wasps and termites at a national or even international level.

12.1.7 Awareness of the role of biological collections and taxonomy in the conservation of biological diversity

The association between biological collections, taxonomy and the conservation of biological diversity, and the notion of biological collections as verifiable biodiversity data were not widely appreciated within El Salvador. Biological collections were generally viewed as out-dated research materials and taxonomists were rarely included in conservation projects. Through the project, in particular the Biodiversity Training course and the lobbying of NGO directors and senior GO officials, it was possible to reverse this impression. This was greatly helped by the SUBSTTA reports on the taxonomic impediment throughout the late 1990's, culminating in the launch of the GTI in 2000.

12.2 Project staff and resources after the project end

12.2.1 Capital equipment. This will remain with the Institutions to whom it was donated at the end of the project. None of the capital equipment has remained in the UK or as property of the NHM. The project portable computer was donated to UES-Agr who placed it at the disposal of their postgraduate programme.

12.2.2 Biological collections. As outlined in 4.1.2, duplicate sets of biological collections were left with the partner institutions. These will represent reference collections and taxonomic research materials for the foreseeable future. They currently form part of existing national collections.

12.2.3 Project staff

No staff were employed as part of this project, partner institutions contributing staff time at no charge. The current situations of the Darwin Scholars and project partners has been explained in section 5.1.1.

12.3 Contact between partners

Yes, the project finished in November, 2002. I am still preparing the final report in February, 2003 and am in regular contact with most of the project partners on a fortnightly basis. In particular with UES-Agr, UES-Bio and LAGU. LAGU and UES are in regular contact and MARN is in contact with UES-Bio on a semi-regular basis. SalvaNATURA and MARN have been working in close collaboration on a number of projects (not directly related to this project). The only break in the partnership is with PROCAFE, which because of its financial situation has made 1/2 of its research staff redundant. Unfortunately this included our main collaborators from PROCAFE.

12.4 Improvement of the project legacy

If we had increased our proposed budget to include funds to pay for two students to take Masters courses in related subjects, for example, one in conservation/resource management and one in entomological or botanical taxonomy, the legacy would have been significantly improved. However, this would probably have added £30,000-40,000 to the project budget and it is very unlikely that this project would have been funded with such a budget increase.

12.5 Additional funds being sought to continue aspects of the project

Additional funds are being sought to undertake the following, continuing the existing project partnerships:

12.5.1 Second edition of trees guide. The current print run of the identification guide to the shade trees of El Salvador is almost exhausted, with ca a dozen copies left. It would be fairly easy to produce a second edition of the identification guide, expanded to include all of the tree genera of El Salvador, with keys to all species. This would cost ca £25,000.

12.5.2 Studentship for postgraduate study. Fund a studentship for one of the biodiversity training course students, Enriqueta Ramírez, to enrol on a Masters course in Environmental Technology. We have contacted the course organisers who seem enthusiastic about receiving an application, however to date we have been unable to identify possible funds. Fees and subsistence would come to ca £25,000.

12.5.3 Biodiversity training course. Make the biodiversity training course in San Salvador an annual or biennial event. The course would be integrated with the UES degree course in biological sciences and would be tailored to meet the needs of the BAP as identified by MARN. This would be a £9,000 cost per course.

13. Value for money

13.1 Considering the costs and benefits of the project, how do you rate the project in terms of value for money

Very good.

13.2 what evidence do you have to support these conclusions?

Compare project outputs (appendices 15 & 16, and the enclosed documentation) with the total cost of the project.

Alex Monro

February 19, 2003

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

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

Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	Project %	Relevant project output
6. General Measures for Conservation & Sustainable Use	10	Objective: 1d, 1e. Outputs: 9, 10i, 10ii, 14aii, 14bviii, 20
7. Identification and Monitoring	40	Objectives: 1c, 2a, 2b Outputs: 10iii, 10iv, 10v, 12ai, 12aii, 12aiii, 12bi, 12bii, 13ai, 13aii, 13aiii, 13bi, 13bii
10. Sustainable Use of Components of Biological Diversity	10	Objectives: 3c, 3d, 4a, 4b Outputs: 7iii, 11bi, 11bii, 11biii
12. Research and Training	30	Objectives: 1a, 1b, 3c Outputs: 6ai, 6aii, 7i, 7ii, 14ai
13. Public Education and Awareness	10	Objectives: 4a, 4b, 4c Outputs: 14bii, 14biv, 14bv, 14bx, 14bxi, 14bxii, 15ai, 15aii, 15aiii, 15aiv, 15av, 15 avi, 15c,
Total %	100%	Check % = total 100

1. Appendix II Outputs

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

Code	Total to date (reduce box)	Proposed Outputs	Outputs achieved
Training Outputs			
1a	Number of people to submit PhD thesis		
1b	Number of PhD qualifications obtained		
2	Number of Masters qualifications obtained		
3	Number of other qualifications obtained		
4a	Number of undergraduate students receiving training		10 students on biodiversity training course
4b	Number of training weeks provided to undergraduate students		20 weeks in total
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(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)	i) 6 ii) 60	i) 7 local scientists (3 university lecturers, 2 researchers and 2 curators). Each spent 1 month at the NHM developing taxonomic skills. ii) 33 local resource managers, NGO workers and undergraduate students attended the project's biodiversity training course (there is an overlap of 10 students with output 4a)
6b	Number of training weeks not leading to formal qualification	204	94 weeks
7	Number of types of training materials produced for use by host country(s): 5	3	5: i) 3 Identification guides ii) 1 Course manual iii) 1 symposium volume
Research Outputs			
8	Number of weeks spent by UK project staff on project work in host country(s)		40
9	Number of species/habitat management plans (or action plans) produced for	1	1 review of MARN's draft report 'Estado actual i diagnóstico de los inventarios de los recursos biológicos.

Code	Total to date (reduce box)	Proposed Outputs	Outputs acheived
	Governments, public authorities or other implementing agencies in the host country (s)		El Salvador C.A.' prepared as part of its CBD Enabling Activities'
10	Number of formal documents produced to assist work related to species identification, classification and recording.	5	5 i) discussion document: 'Building El Salvadors Taxanomic Capacity' prepared on as a consultancy for MARN ii) discussion document: 'Assessing and Enhancing Taxonomic Capacity' prepared on as a consultancy for MARN iii) Identification guide to the <i>Pimplinae</i> wasps of shade coffee farms iv) Identification guide to the <i>ferns</i> of shade coffee farms v) Identification guide to the <i>trees</i> of shade coffee farms
11a	Number of papers published or accepted for publication in peer reviewed journals	3	1 paper submitted to International Journal of Biodiversity Conservation
11b	Number of papers published or accepted for publication elsewhere	3	3: i) 1 paper in 'Café y biodiversidad' symposium volume ii) 1 paper in the Salvadoran journal <i>Pankia</i> iii) 1 book chapter for 'Taking Stock of Nature' edited by A. Lawrence
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	3	3 i) Pimplinae wasps of shade coffee farms in El Salvador ii) Trees of shade coffee farms of El Salvador iii) Ferns of shade coffee farms of El Salvador
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country 2		2 i) Jardín Botánico de La Laguna vascular plant database ii) Escuela de Biología (Universidad de El Salvador) vascular plant
13a	Number of species reference collections established and handed over to host country(s)		6 i) 2 Trees & ferns of shade coffee farms ca. 300 specimens each to UES (Escuela de Biología) and LAGU ii) 3 Pimplinae wasps of shade coffee farms(also first national collections of Pimplinae for El Salvador), ca 180

Code	Total to date (reduce box)	Proposed Outputs	Outputs achieved
			each to UES (Facultad de Agronomía), Museo de Historia Natural de El Salvador (MUNHES) and the Centro Nacional de Tecnología Agropecuaria y Forestal (CENTA) iii) 1 Termite of shade coffee and agricultural land (first national collections) of ca 300 specimens to UES (Facultad de Agronomía)
13b	Number of species reference collections enhanced and handed over to host country(s)	3	5: i) 2 Vascular plant collections: LAGU & UES (Escuela de Biología) ii) 3 Hymenoptera collections of UES (Facultad de Agronomía), MUNHES, CENTA

Dissemination Outputs			
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	1	2 i) 1 symposium 'Biodiversidad y Café' organised jointly with SalvaNATURA ii) 1 workshop 'Prioritización de los servicios de la diversidad biológica' organised jointly with the Department of 'Patrimonio Nacional' of MARN
14b	Number of conferences/seminars/workshops attended at which findings from Darwin project work will be presented/ disseminated.	3	12 presentations i) Systematics Association, Glasgow, 1999 ii) British Association for the Advancement of Science, Science Festival, Sheffield, 1999 iii) Congreso de la Sociedad Mesoamericana para la Biología y la Conservación, Guatemala City, 1999 iv) South London Botanical Society Lecture Series, London, 2000 v) Royal Botanic Gardens, Kew, Public Lecture Series, London, 2000 vi) Annual project workshop for GEF-GTZ project in association with PROCAFE, 'Café y Biodiversidad' San Salvador, 2001 vii) Biodiversidad y Café Symposium, San Salvador, 2001 viii) Conferencia Taller de Inventarios

			<p>y Monitoreo de la Biodiversidad, MARN, San Salvador, 2002</p> <p>ix) Ecological Society of America, Coffee and biodiversity workshop, Tucson, 2002</p> <p>x) project presentation to UK Foreign Secretary of State, John Battle MP, October 2000</p> <p>xi) project presentation to Lady Kleinwort, October 2001</p> <p>xii) project field visit by Her Majesty's Ambassador to El Salvador, His Excellency Patrick Morgan, December 2001</p>
15a	Number of national press releases or publicity articles in host country(s) 2	2	<p>3 Press releases</p> <p>i) Project launch, June 1999</p> <p>ii) First biodiversity training course, November 2000</p> <p>iii) Publication of identification guides: March 2002</p> <p>5 Press articles</p> <p>iv) 2000: La Prensa Gráfica, El Diario de Hoy</p> <p>v) 2002: La Prensa Gráfica, La Prensa Gráfica book review, La Prensa Gráfica</p> <p>vi) Project Posters 1000 copies printed and distributed within El Salvador</p>
15b	Number of local press releases or publicity articles in host country(s) 6	1	na
15c	Number of national press releases or publicity articles in UK 1		<p>1 Press release</p> <p>1999: project launch</p>
15d	Number of local press releases or publicity articles in UK		0
16a	Number of issues of newsletters produced in the host country(s) 0	1	see project web pages news section
16b	Estimated circulation of each newsletter in the host country(s)	100	ca 500 per month (not possible to separate by country)
16c	Estimated circulation of each newsletter in the UK	30	ca 500 per month (not possible to separate by country)
17a	Number of dissemination	1	1

	networks established 1		Project web pages
17b	Number of dissemination networks enhanced or extended		0
18a	Number of national TV programmes/features in host country(s)	2	2 2002: Darwin scholar interviewed for Channel 12 News, Canal Seis
18b	Number of national TV programme/features in the UK		0
18c	Number of local TV programme/features in host country		na
18d	Number of local TV programme features in the UK		0
19a	Number of national radio interviews/features in host country(s)	2	2 2002: radio interview for Radio Nacional El Salvador, radio interview Canal Seis
19b	Number of national radio interviews/features in the UK		2 i) 1999: BBC World Service ii) 2002: Australian Broadcasting Corporation
19c	Number of local radio interviews/features in host country (s)		0
19d	Number of local radio interviews/features in the UK		0
Physical Outputs			
20	Estimated value (£s) of physical assets handed over to host country(s)	12,000	£21,003.14
21	Number of permanent educational/training/research facilities or organisation established		0
22	Number of permanent field plots established		0
23	Value of additional resources raised for project		£21,853.52 (Total) i) £1,050.72 IUCN Small Grant ii) £6000 from Avina Inc. project 'Trees of the Maya area' towards the cost of illustrations for the identification guide to the trees of shade coffee farms iii) £14,802.80 BA Assisting Conservation Programme 2 return flights to Houston 2 return flights to Mexico City

Appendix II: Publications

Provide full details of all publications and material that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Details will be recorded on the Darwin Monitoring Website Publications Database that is currently being compiled.

Mark (*) all publications and other material that you have included with this report

Type *	Detail (title, author, year)	Publishers (name, city)	Available from (e.g. contact address, website)	Cost £
Monograph*	<i>Árboles de los cafetales de El Salvador</i> Alex Monro, Diccon Alexander, Jesús Reyes, Miguel Renderos, Nohemy Ventura 2001 ISBN: 0565091700	The Natural History Museum, London	Departmental Administrator, Department of Botany, The Natural History Museum, London SW7 5BD a.hutson@nhm.ac.uk Libreria, Universidad de El Salvador, San Salvador, El Salvador C.A.	£9.00 \$12.00
Monograph *	<i>Helechos de los cafetales de El Salvador</i> Alex Monro, Jorge Monterrosa, Nohemy Ventura, David Godfrey, Diccon Alexander, María Carmen Peña Chocarro 2002 ISBN: 0565091719	The Natural History Museum, London	Departmental Administrator, Department of Botany, The Natural History Museum, London SW7 5BD a.hutson@nhm.ac.uk Libreria, Universidad de El Salvador, San Salvador, El Salvador C.A.	£9.00 \$12.00
Monograph *	<i>Guía para la identificación de los Pimplinae de cafetales bajo sombra de El Salvador (Hymenoptera: Ichneumonidae)</i> Ian D. Gauld, Rafael Menjivar, María Ofelia González, Alex Monro 2002	The Natural History Museum, London	Departmental Administrator, Department of Botany, The Natural History Museum, London SW7 5BD a.hutson@nhm.ac.uk Libreria, Universidad de El Salvador, San Salvador, El Salvador C.A.	£9.00 \$12.00

	ISBN: 0565091727			
Monograph *	<p><i>Actas del simposio café y biodiversidad</i></p> <p>Alex Monro & María Carmen Peña Chocarro</p> <p>2002</p> <p>ISBN: 0565091816</p>	<p>The Natural History Museum, London & Universidad de El Salvador</p>	<p>Departmental Administrator, Department of Botany, The Natural History Museum, London SW7 5BD a.hutson@nhm.ac.uk</p> <p>Libreria, Universidad de El Salvador, San Salvador, El Salvador C.A</p>	<p>£9.00</p> <p>\$12.00</p>

Appendix III: Darwin Contacts

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

Project Title	Empowering local people to manage the biodiversity of El Salvador
Ref. No.	162/8/150
UK Leader Details	
Name	Alex Monro
Role within Darwin Project	Project Leader
Address	Department of Botany, The Natural History Museum, London, SW7 5BD
Phone	
Fax	
Email	
Partner 1	
Name	Jorge Ernesto Quesada
Organisation	CBD Focal Point, Ministerio de Medio Ambiente y Recursos Naturales (MARN)
Role within Darwin Project	MARN Focal Point: main point of contact for integration of project with El Salvador's BAP and national priorities
Address	Patrimonio Nacional, 4ta nivel, Torre El Salvador IPSFA, Alameda Roosevelt y 55 Avenida Norte, San Salvador, El Salvador C.A.
Fax	
Email	
Partner 2	
Name	Nohemy Ventura
Organisation	Profesora de Botánica, Escuela de Biología, Universidad de El Salvador
Role within Darwin Project	Escuela de Biología Focal Point, Darwin Scholar
Address	Escuela de Biología, Universidad de El Salvador, San Salvador, El Salvador, C.A. (note: building temporarily out of use for the Central American Games until May-June 2003)
Fax	
Email	
Partner 3	
Name	Ines María Ortiz
Organisation	Directora, 'Proyecto Café y biodiversidad' PROCAFE
Role within Darwin Project	PROCAFE Focal Point: main point of contact for integration of project with PROCAFE priorities
Address	(no longer employed by PROCAFE, currently working for FAO)
Fax	(no longer employed by PROCAFE, currently working for FAO)
Email	
Partner 4	
Name	Roberto Escobar Lechuga
Organisation	Director, Jardín Botánico La Laguna
Role within Darwin Project	Jardín Botánico La Laguna Focal Point: main point of contact for the Jardín Botánico La Laguna
Address	Jardín Botánico La Laguna, Plane de La Laguna, Antiguo Cuscatlan, CG 2260, La Libertad, El Salvador C.A.
Fax	
Email	
Partner 5	
Name	Rafael Menjívar
Organisation	Profesor de Protección Vegetal, Facultad de Ciencias Agronómicas
Role within Darwin Project	Facultad de Ciencias Agronómicas Focal Point: main point of contact for the entomological component of the project
Address	Escuela de Protección Vegetal, Facultad de Ciencias Agronómicas, Universidad de El Salvador, San Salvador, C.A.
Fax	
Email	