

***DARWIN INITIATIVE FOR THE SURVIVAL
OF SPECIES***



***Biodiversity, conservation and sustainable
use in a Mexican cloud forest***

FINAL REPORT

Project reference No. 162/8/076

Darwin Initiative for the Survival of Species

Final Report

1. Darwin Project Information

Project title	Biodiversity conservation and sustainable use in Mexican cloud forest
Country	Mexico
Contractor	University of Edinburgh
Project Reference No.	162/8/076
Grant Value	64950
Starting/Finishing dates	1.4.99 - 31.3.02

2. Project Background/Rationale

The project focused on the area of El Rincón, Sierra Norte, Oaxaca, Mexico. The montane cloud forest, the focus of this project, lies between 1600-2300 m near the municipalities of Tanetze de Zaragoza, Talea de Castro and Juquila Vijanos (Zapotec ethnic group). The forest is mostly owned by local communities who depend on the forest for a large number of products, the most important of which are firewood, medicine and crafts. Almost nothing is known of the impact of these uses on forest dynamics, structure and composition. Plans for the sustainable management of these resources by local communities are urgently required if the forest is to be effectively conserved; at present, none of the area is officially protected. At the outset of the project, the local communities were considering denoting an area of 6400 ha (El Gavilan), which is relatively remote and near-pristine, as a protected area, with potential for development for ecotourism. This is surrounded by secondary forest, providing an opportunity to develop a conservation plan based on definition of 'core' and 'buffer' zones, the latter permitting sustainable extraction of forest products by local people, particularly the economically important endemic pine, *Pinus chiapensis*.

Key objectives of the project were therefore:

- (i) to strengthen the capacity of CIIDIR to undertake research into conservation and use of biodiversity
- (ii) to undertake a programme of inventory and research into the biodiversity of the El Gavilan area
- (iii) to investigate the ecological impact of extraction of forest products by local people
- (iv) on the basis of the results obtained, to develop a management plan for the conservation and sustainable management of montane cloud forest in El Rincon.

The project was identified by staff of CIIDIR, Oaxaca, Mexico, and through discussions

with staff from the University of Edinburgh. The focus of the project was developed on the basis of field research by CIIDIR staff in the proposed project area, and in particular, on pilot ethnobotanical and floristic surveys which have indicated the exceptional biological importance of the El Rincon area. Mexico is ranked as one of the twelve most species-rich countries on earth, and the southern States of Mexico are the most diverse in the country. For example, the area supports 8,300 species of plants, 60% of Mexico's bird species, and over 30% of its mammal, reptile and amphibian species. Oaxaca is the state of highest biodiversity in Mexico but is also one of the economically most disadvantaged, with a high degree of rural poverty. The area is currently confronted with unprecedented pressures of population growth and economic change, and therefore there is an urgent need to develop conservation methodologies appropriate to existing cultural systems. The entire region (Sierra Norte) to which El Rincon belongs is considered as one of the highest priority areas defined by CONABIO (Comisión Nacional para el conocimiento y uso de la Biodiversidad), the organization responsible for implementing the Biodiversity Convention in Mexico, for purposes of in situ conservation based on: (a) richness of endemic and threatened species; (b) high floristic and faunistic diversity; (c) high pressure of land use, and (d) the fact that this area comprises the biggest extension of cloud forest in Mexico, and is also the best preserved. Montane cloud forest is one of the most important habitats in Mexico for biodiversity. Although occupying only 1% of the total land area of the country, it contains 10% of the species, including approximately 900 endemic plants. It is therefore the most diverse vegetation type per unit area. The focus of this project, relating to institutional strengthening, training and research in montane cloud forest of the Sierra Norte therefore directly addressed the needs of the Biodiversity Convention, as identified in CONABIO's priorities. The linking of rural communities, conservation and research organizations, which was also a feature of this project, has also been identified as a key component of the country's Tropical Forestry Action Plan.

CIIDIR, the Mexican counterpart for the project, is a state-owned research and training institution, forming part of the National Polytechnic Institute (IPN). CIIDIR is the only local research institution with a remit focusing on biodiversity conservation, but its activities are limited by the breadth of skills available to undertake the necessary interdisciplinary research. CIIDIR is short-staffed and had very limited resources to undertake field-based research, at the outset of the project. A key objective therefore was to strengthen the institutional capacity at CIIDIR, involving equipment purchase and training secondments to relevant institutions in the UK for senior and junior research personnel. In addition, it was hoped that the development of close collaborative links with senior scientists in the UK will help overcome the intellectual isolation from which CIIDIR has previously suffered. Having been conceived and developed by CIIDIR, the project had extremely strong support from the Mexican counterparts; indeed for the research group involved, this was their first ever project funded externally, and their first collaborative venture with scientists from another country.

3. Project Summary

Objectives :

- (i) to strengthen the capacity of CIIDIR to undertake research into conservation and use of biodiversity
- (ii) to undertake a programme of inventory and research into the biodiversity of the El

Gavilan area

- (iii) to investigate the ecological impact of extraction of forest products by local people
- (iv) on the basis of the results obtained, to develop a management plan for the conservation and sustainable management of montane cloud forest in El Rincon.

These objectives were not amended during implementation of the project, although the relative emphasis on these different objectives shifted somewhat as the project evolved through time. In particular, the development of the management plan proved to be politically and socially more complex than anticipated at the outset of the project.

The Article under the Convention on Biological Diversity (CBD) that best describes the project was 12, Research and training, although the project was also relevant to a number of other articles (see Appendix I).

In general, the project was highly successful in meeting its objectives. With the assistance of UK partners, and the resources supplied by the project, CIIDIR were able to undertake and detailed programme of research and assessment into the biodiversity and ecology of the cloud forest in the El Rincon area. Capacity was strengthened in a number of key areas:

- Provision of scientific books and journals to the library at CIIDIR, which greatly helped in the development and implementation of research projects by staff and students
- Provision of a field vehicle by the Project was of absolutely critical importance, enabling a detailed programme of fieldwork to be undertaken at the study site; without the vehicle, and the support from the project for its purchase and running costs, this fieldwork would have been completely impossible, as the field sites are remote and no alternative vehicle was available
- Exchange of laboratory techniques, experimental design and data analysis methods between UK and Mexican senior staff was undoubted value, and greatly welcomed by the counterparts. Training in such methods was provided during visits to the UK by Mexican staff, and by UK staff to Mexico. Subsequently the methods learned have been implemented in Mexico, and form the basis of ongoing research. For example, the CIIDIR laboratory now has computer hardware and software, with staff trained in Geographical Information Systems, enabling them to develop maps of their study area - an entirely new venture for the group. Such maps have been invaluable for research planning and implementation, and for the analysis and integration of field data. A further example is that CIIDIR staff are now trained and equipped to undertake genetic analysis of plant materials, using DNA markers - another entirely new venture.
- Collaboration with the preparation of scientific manuscripts for publication has helped bring the work of CIIDIR to an international audience, and has enabled the capacity of CIIDIR staff to write and publish in English to be significantly strengthened; this activity will continue after completion of the project

- Raised profile of CIIDIR within Mexico. This was a highly beneficial outcome not anticipated at the outset of the project. One of the characteristics of CIIDIR, and the main constraints to undertaking biodiversity research, was their isolation not only from the international scientific community, but from other scientists working on similar themes within Mexico. At the project closure workshop in 2002, staff and students were invited from a number of other key research and training institutions in other states of Mexico. The resulting exchange of experience and information was of exceptional and lasting value, and has led to a number of new collaborative ventures. At present, few opportunities and resources exist to facilitate development of collaborative links between Mexican institutions, so the project has undoubtedly had a major impact in this area. For example, this was the first time that major research teams from Veracruz (Xalapa) and Chiapas, working in similar forest types, had ever had the chance to visit natural forests in Oaxaca, and to learn of the research that CIIDIR has undertaken there.

A substantial body of research was completed, leading directly to the undergraduate and postgraduate degrees of a number of Mexican students, and generating highly novel data on an area that has received very little attention from researchers in the past. Highlights of the research include:

- The first ever assessment of diversity of soil invertebrates in the Sierra Norte of Oaxaca, and the first ever analysis of the relationship between diversity of soil fauna and ecosystem processes in a neotropical cloud forest
- The ecological description and analysis of a unique successional chronosequence, from agricultural land through pine / *Liquidambar* forest to mature cloud forest. The El Rincon field site is of exceptional importance in that it possesses not one but several such chronosequences, enabling ecological analyses to be replicated. Such chronosequences have not been identified anywhere else in cloud forest in Mexico, nor (to our knowledge) anywhere else in the neotropics. Understanding successional processes through analysis of chronosequences is of great importance, as it enables assessments to be made of how rapidly the forest ecosystem (including key ecosystem processes, as well as composition) can recover after disturbance from human activity. This is of key importance for determining the thresholds of resource extraction that are consistent with sustainable management.
- The first ever ecological assessments of *Pinus chiapensis*, a threatened, endemic pine species that is also of high economic, social and cultural value to local communities. Collection of demographic and genetic data has enabled an integrated model to be constructed, which can be used to define the impacts of logging on the population viability of the species, and thereby to define the relative sustainability of different management options.

The project therefore successfully provided a basis for assessing the ecological impact of extraction of forest products by local people. The objective of the project was to apply such knowledge to assist local communities in the development of a management plan for the El Rincon area. A draft plan was developed and discussed with local communities, local Government representatives and NGOs active in the region. The project therefore

initiated a planning process, but this was not completed during the project and is ongoing.

4. Scientific, Training, and Technical Assessment

Training

Darwin Initiative funding was instrumental in the training of Mexican staff, students and coworkers. Two types of training were accomplished: (a) Long-term training for a period of at least 12 months. This kind of training included, in most of the cases, the design, execution, writing, and completion of a thesis project by a student. (b) Short-term training included short visits to UK by Mexican staff, students and coworkers and short visits to Mexico, by European students and researchers.

Thesis projects (long term- training)

Darwin Initiative funding contributed to the design, execution and writing of seven thesis projects. All of them consisted of a training period of at least one year. Training included field and laboratory work, data analysis and writing. In addition to the trainees listed in Table 1, Janette Cordova, an undergraduate student, worked for the project conducting research which assessed the value of epiphytes as bioindicators in the cloud forest. The results of this investigation have already been published (see list of papers and manuscripts). Jeanette received training for 18 months including sampling design, fieldwork, plant identification, data analysis and writing.

Short term training

Elaine Marshall, a M.Sc. from UK (Institute of Ecology and Resource Management, University of Edinburgh) conducted preliminary studies of forest resource use patterns during 1 month at the study area. She worked together with Janette Cordova, and provided training to the latter in a range of social research techniques. Elaine and Janete undertook interviews in the communities to assess the use of non timber products in the forest and conducted workshops to assess the perception of the forest in separate groups of men and women. ([reports\forestresource.doc](#)). She later developed a separate project on non-timber products in the same region.

Janete Cordova, a former student from CIIDIR, received short training from Elaine Marshall.

Ana Rito, a research assistant from the University of Edinburgh, produced the digital cartographic basis of the project by setting up a Geographic Information System for the study area for CIIDIR. She also visited CIIDIR and provided training to Raul Rivera in the use of the GIS software ArcView®. This GIS database is now being successfully managed and used by Raul, as part of his ongoing support to the CIIDIR team.

Raul Rivera, a Mexican coworker at CIIDIR, was trained by Ana Rito during her visit to our research center in Oaxaca, Mexico. After such training, he continued learning use ArcView and was responsible for the completion of all the GIS work for the study area.

Simoneta Negrete, currently registered for a Ph. D. at the University of Edinburgh, received financial support from the project for traveling from Mexico to Edinburgh; the project also supported her field costs. Tuition costs were covered by a grant from

CONACYT. Simoneta has received intensive training in experimental design and analysis, a range of ecological field techniques, taxonomy of soil invertebrates, scientific writing and presentational skills.

Rafael F. del Castillo, a senior researcher at CIIDIR, Instituto Politécnico Nacional, visited the Institute of Ecology and Resource Management, University of Edinburg, Scotland (August 14-28th, 2000). During this visit, he received training from senior UK staff, in laboratory techniques, data analysis and presentation. Dr. del Castillo also participated in a workshop focusing on forest conservation and management in Mexico, held in Xalapa, and also received further training during visits of senior UK staff (Ennos and Newton) to Mexico.

Philip Bubb from the United Nations Environmental Program, World Conservation Monitoring Centre visited CIIDIR Oaxaca during early 2002. He helped the personnel of CIIDIR to establish links with other institutions involved in conservation, namely Grupo Mesófilo, an non governmental organization, and SEMARNAT, a federal institution, involved in planning and legislation of Mexican Natural Resources. He also provided training in rural development planning.

Sonia Trujillo Argueta a junior researcher from CIIDIR received training on molecular biology techniques at the at the Institute of Ecology and Resource Management, University of Edinburgh, Scotland (August 14-28th, 2000), and from visits made by UK staff to Mexico (Ennos and Newton).

Table 1. Thesis projects funded by the Darwin Initiative for the Survival of Species through the project Biodiversity, conservation and sustentable use in a Mexican cloud forest.

Thesis	Author	Status	File attached
The multivariate relationship between the diversity of soil macrofauna community and changing environmental conditions along a chronosequence of Cloud Forest in Oaxaca, Mexico	SIMONETA NEGRETE Y	In progress	thesis\repdarwin2.doc
Indicadores de la calidad del suelo en tres cronosecuencias de bosque mesófilo de montaña: Sierra Norte, Oaxaca.	BAUTISTA CRUZ, M.A. *	Concluded	thesis\tesisangelica.pdf
Análisis sucesional en el bosque mesófilo de montaña en el Rincón, Sierra Norte de Oaxaca	BLANCO MACÍAS, A. *	Concluded	thesis\alex.pdf
Influencia del suelo en el crecimiento de cuatro especies arbóreas a lo largo de un gradiente sucesional de un bosque mesófilo de montaña, Sierra Norte, Oaxaca.	HERNÁNDEZ PÉREZ, V. *	Concluded	thesis\tesisvero.pdf

Mineralización del nitrógeno en suelos de bosque mesófilo en la región de El Rincón, Sierra Norte, Oaxaca	VELÁZQUEZ ARAGÓN, ALBERTO*	Concluded	thesis\tssalber.pdf
Modelos de crecimiento para <i>Pinus chiapensis</i> (Mart.) Andresen de El Rincón, Oaxaca, México	SÁNCHEZ VARGAS, N.	Concluded	thesis\nahum.jpg
Ecología de comunidades de Pequeños Mamíferos en tres estados Sucesionales de bosque mesófilo De Montaña En Oaxaca, México	HERNÁNDEZ AYALA YURI	In progress	thesis\mamiferos.doc

* The thesis exam certificate is attached as a file and a hard copy of thesis is enclosed.

Research results

Details of research results are provided in the attached publications and reports. Brief details are included here.

The project made a significant contribution to biodiversity assessment of the cloud forest of the study area. In particular, the project provided the first ever assessments of soil macrofauna from cloud forest in Mexico, and their role in ecosystem processes, through Simoneta Negrete's PhD research (which is currently being written up). The thesis of Negrete not only provides evidence of the variation in composition and functional structure of soil macrofauna communities during secondary succession of the cloud forest, but also reveals how spatial patterns of these organisms change. The implications of these changes for dynamics of leaf litter decomposition and nutrient cycling were examined experimentally.

The thesis of Blanco (2001) made a significant contribution to the knowledge of the flora of vascular plants in the area, involving the first systematic floristic inventory of the area. The thesis by Yuri Ayala provided the first survey of small mammals in the study area. Finally, the article of Cordova and del Castillo (2001) provides a list of vascular plants and major groups of epiphytes. These studies not only contribute to the knowledge of the biodiversity of the area, but also investigated how biodiversity change through secondary succession, through description and analysis of the successional chronosequences referred to earlier. In this way, these studies have enabled an assessment to be made of the impact of disturbance resulting from human activity on biodiversity of different groups of organisms, from small mammals, soil macrofauna, vascular epiphytes and terrestrial vascular plants.

Except for the work of Ayala, all of these studies included true replicates of seral states, something unusual in studies of succession. The study of Ayala could not include true replicates as sampling of small mammals requires continuous sampling throughout all year in all the selected sites. This precludes sampling in more than one chronosequence. Finally, the study of the flora of El Gavilán area produced a list of 218 species of vascular plants.

Darwin Initiative funding was also instrumental in developing soil studies in the cloud forest. Virtually no soil information was available prior to this project for this kind of

forest in Mexico. A brief summary of the studies funded by the present project is given below.

No study of soil classification had previously been performed in the study area and very few such investigations have been performed in other cloud forest of the world. The study of Bautista *et al.* (*in revision*) was the first to classify the soils of a Mexican cloud forest. The thesis of Bautista (2001) shows how soil properties change during secondary succession of the cloud forest using three chronosequences. This study is unique, as we are not aware of any other study performed in tropical montane cloud forest anywhere in the world that documents changes in soil properties during secondary succession with three independent replicates (chronosequences). This study provides evidence that soil properties may change dramatically during secondary succession and, therefore, they may potentially influence the species composition and structure of plant communities.

The thesis of Hernández Pérez, shows that plants typical of different seral stages have different responses to growth and resource allocation to soils from different seral stages. Thus, it is possible that changes in soil properties affect the course of secondary succession in cloud forest. The study of Velázquez shows that potential nitrogen mineralization changes during the course of secondary succession; and that ammonia is the dominant form of nitrogen in old seral stages, whereas nitrate is dominant in early successional states. These results are important in the design of forest restoration plans, as forest plants can be very selective to the form of nitrogen in soil.

In addition to these studies, detailed analysis of the genetic and demographic characteristics of *Pinus chiapensis* provided the first such assessments of this socio-economically important, endemic timber tree. This project focused particularly *Pinus chiapensis* for the following reasons: (a) this pine is the dominant species of young secondary forest surrounding the towns of El Rincón, (b) because of the quality of its wood, this pine is the most important forest resource available in the area, (c) this species is considered threatened. (d) we are not aware of any serious intent to preserve this species. A major contribution of the present project is the indication that pine forests in the area are secondary and depend almost exclusively on human intervention for their maintenance. We have collected demographic information for several years using permanent plots and conduct a series of simulations to explore the impact on population structure of forest extraction. The thesis of Nahum Sánchez Vargas developed growth models and site indices for *Pinus chaipensis* at the study site. Genetic analyses have also been completed indicating a high level of population differentiation and inbreeding, raising concerns about the viability of many populations of the species. A first paper on genetic aspects has been published in *Heredity*, and further manuscripts are in preparation.

The study by Elaine Marshall and Janete Cordova focused on the impact of fuel wood extraction by local people (see attached report). This research highlighted the importance of the forest area as a source of fuelwood for local communities. Although mentioned in the original proposal, we did not undertake substantial research into *Magnolia dealbata* for the following reasons: (a) our studies revealed that this species is not common in the area and (b) this species is already protected by the people of the communities. In particular, when a site is cleared for agriculture or for other reasons (e.g. trails, right-of-ways of electricity lines, roads, etc.) people do not cut down this plant. Commercially is

not very important and it is used only seasonally, during the spring when the plants are blooming, as an ornamental.

The project also developed a series of bioindicators which can be used to monitor the ecological state of the forest. For example, one of the publications produced describes the use of epiphytes for this purpose. Our results show that small mammals, plants, and soil properties can be used as bioindicators for cloud forest monitoring. In addition, we enclose a report proposing a conservation area in El Gavilan as a core zone and a management plan in the secondary forest of Juquila, most of them surrounding the core zone. CIIDIR continues to be in communication with the communities regarding the use and conservation of the forest area at El Rincon.

We have already completed six manuscripts that were derived, totally or partially, from Darwin Initiative Funding. Three of them are already published. The others have been submitted, and two are currently in press. Although not part of the research program, an additional published scientific paper by Vargas and del Castillo on theoretical population genetics was included in the list of publications because this study was performed with aid of the computer equipment purchased with the Darwin Initiative funding. As developments in population genetics are necessary for conservation issues, we considered this paper as an additional output of the present project. The Darwin Initiative support was acknowledged in the article.

In addition to this list, at least eight additional scientific manuscripts are going to be derived from the project, which are already in an advanced state of preparation, focusing on:

- (a) Demography of *Pinus chiapensis*.
- (b) Changes in soil properties during secondary succession of a cloud forest.
- (c) Vegetation studies during the secondary succession of a montane cloud forest, and
- (d) Multivariate relationships between diversity of soil macrofauna community and changing environmental conditions along a chronosequence of cloud forest.

Also, Darwin Initiative funding was important to initiate a series of studies for which additional funding will be needed to complete. For example, our study of nitrogen mineralization *in vitro* was a good starting point for a further study of the same process in the field, rather than the laboratory. The Darwin Project also catalysed the development of a major international research project funded by the European Community, in which CIIDIR will participate along with eight other partner institutions from Mexico, Chile, Argentina, UK, Spain and Germany. This new project will complete the floristic and faunal studies of the present project.

5. Project Impacts

There is no doubt that the project has achieved its main objective - the capacity of CIIDIR to undertake biodiversity research has been substantially strengthened. The best indicators of this are the burgeoning profile of the CIIDIR team through publication of scientific papers in international, refereed journals. The team had produced no scientific

papers on cloud forests prior to this project. The success of the team is also illustrated by the fact that it has been successful in gaining further financial support for its research activities, most significantly a major grant as part of a multi-disciplinary EC project, focusing on conservation and sustainable use of cloud forests. CIIDIR would certainly not have been successful in gaining this grant without the experience and skills, as well as contacts, gained during the Darwin project.

The project has also undoubtedly assisted Mexico in meeting its obligations under the Biodiversity Convention (CBD), particularly in the context of:

- Identifying and monitor components of biological diversity, particularly those requiring urgent conservation (eg cloud forest); identify processes and activities which have adverse effects (eg logging and agriculture);
- promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries
- in situ conservation: promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species

A draft plan produced by the project for the conservation of the El Rincon area was produced by the project, and continues to be developed by CIIDIR, SEMARNAT and the communities in the area. As mentioned previously, the project has also played a major role in developing local collaboration between CIIDIR, government planning agencies, community organisations and other NGOs. These links were entirely non-existent prior to the project.

The social impacts of the project are undoubtedly likely to be positive, if only because the access of the communities to scientific information relating to their forest area has been substantially increased. As a result of the project, NGOs (such as SERBO, WWF), which have major conservation programmes in the Sierra Norte, are now taking a strong interest in El Rincon. If the management plan initiated here can be further developed and successfully implemented, it should have a direct beneficial effect on the economic status of the communities concerned, however this is probably still some way off.

The Darwin project directly led to development and implementation of a DFID-funded project, focusing on the use of non-timber forest resources by local communities. This project has implemented a detailed analysis of the links between human wellbeing in rural communities and the use of forest resources, within the Sierra Norte of Oaxaca. A variety of indicators have been developed, including assessments of economic income, health and education. These are being used to evaluate the actual and potential impact of commercialisation of non-timber products by local communities, and could therefore be used to assess the socio-economic impact of the present project.

6. Project Outputs

All of the project outputs listed on the original proposal were achieved. Details of outputs are given in Appendix II. Appendix III provides details of publications and material that can be publicly accessed. It should be noted that a number of additional publications are likely to be produced in future, as data generated by the project continues to be written up for publication.

Project outputs are currently being disseminated via the project website developed and

maintained by CIIDIR. They will also be disseminated through the website of the Tropical Motane Cloud Forest Initiative, hosted and maintained by UNEP World Conservation Monitoring Centre. This is currently under development.

(<http://www.unep-wcmc.org/forest/cloudforest/english/homepage.htm>).

Our writing dissemination work included one newspaper article and one magazine article ([dissemination\newspaper.jpg](#), [dissemination\NUBES.pdf](#)). Our results were presented to the community of Juquila Vijanos and San Miguel Yotao in different ways: (a) a copy of our results was provided ([community\juquila.tif](#); [community\yotaodoc.jpg](#); [community\delicias.jpg](#)); (b) a video was presented to the indigenous communities ([community\video_meso.WMV](#)); and (c) formal and informal talks were held with the members of the communities and authorities involved in conservation, permissions for logging and forest management.

7. Project Expenditure

Expenditure was as described in the original proposal, with the addition of UK staff members Ana Rito, Elaine Marshall and Philip Bubb

Table A

Table B

Table C

8. Project Operation and Partnerships:

CIIDIR were the local partner organisation, according to the project as defined in the proposal. They are a research and training organisation, who were fully involved in project planning and implementation. The project was in fact conceived by the local partners and implemented by them, with support from UK institutions.

During implementation of the project, collaborative links were formed with other institutions in the host country, including the Instituto de Ecologia in Xalapa, and El Colegio de la Frontera Sur in Chiapas. This collaboration culminated in a joint project workshop in Oaxaca, and will continue under the auspices of a new joint research project (BIOCORES) which arose directly out of the Darwin project. This new project will further consolidate links with local communities and local Government that were initiated under the Darwin project.

The international partners were the Institute of Ecology and Resource Management, University of Edinburgh, and the UNEP World Conservation Monitoring Centre.

9. Monitoring and Evaluation, Lesson learning

No formal internal or external evaluation of the project was performed during its period of operation. Progress was monitored continually by the project coordinator, against the milestones and objectives outlines in the original proposal, and as all of these were achieved, the project is considered to have been successful. In terms of its role in catalysing the development of new projects, the project has been outstandingly successful, having resulted in the development of two new projects in the area, totalling approx. \$2 million in value.

The area where the project was least successful was in development and implementation of the management plan for the El Rincon area. Achieving a genuinely participatory process for development of the plan proved to be far more politically and socially complex than anticipated. This issue is of some interest, as it may have implications for Darwin Initiative projects elsewhere, so we treat it here in some depth.

It is first helpful to consider the position of CIIDIR at the outset of the project. As a government-run research and training institution, based in the city of Oaxaca, CIIDIR's contact with local communities had previously been limited. The research team that participated in this project had, prior to the project, discovered the potential scientific value of the El Rincon fieldsite, and had begun to plan and implement a programme of field research. The Darwin project was of critical importance in enabling this field research to take place, and the UK staff involved in the project were content that CIIDIR had taken appropriate steps to consult with the local communities in the El Rincon area, and gain their permission to undertake the research programme. Indeed, the field research was welcomed by communities once its potential value, in developing sustainable management plans, had been understood.

The field research programme was duly implemented, and during the second year, an

attempt was made to initiate a programme of socially-focused research. The current use of the forest by local communities was analysed by a programme of social research (using participatory rural appraisal, rapid rural appraisal and other social research techniques), which was initiated by a social science specialist seconded from the UK (Elaine Marshall) as part of the project, who trained CIIDIR staff through a collaborative programme of research. This area of research was entirely new to the CIIDIR team. Although the research successfully generated valuable information, this component of the project highlighted an interesting challenge. The CIIDIR team, composed essentially of biophysical scientists, had no previous experience of participatory social research, and while keen to learn and keen to ensure that their research was genuinely of value to the local communities, the required process of dialogue with local community representatives was something entirely new to them.

In the third year of the project, the UK partners therefore decided to focus the provision of capacity building on the social side, by seconding an additional social science specialist (Philip Bubb), who has extensive experience of developing and implementing integrated conservation and development projects with rural communities in Mexico. The focus of Philip's input was to help bring about a closer link between the research undertaken by CIIDIR, and the needs of the communities in El Rincon. He also helped to initiate a dialogue with representatives of governmental and non-governmental organisations in the region, with the aim of developing a management plan for the area, that would be respected by appropriate authorities, as indicated in the original project proposal.

The intervention of UK staff in this way led to a number of significant achievements. For the first time, CIIDIR staff were made aware of the value of communicating their field results to the local communities in their study area, and as a result, a workshop was held in a community at which CIIDIR staff and students presented the results of their research. Representatives of the local community, including schoolchildren, were invited to participate in the fieldwork. CIIDIR, with assistance from the UK staff, attempted to broker a dialogue between the communities and local government representatives, specifically to discuss development of a management plan for the forest area at El Rincon. This was an entirely novel initiative for CIIDIR.

This defines the approximate limit of the achievements of the project towards its fourth objective. The results of the field research have been made available to the local community, and assistance has been offered in development of the plan, including assistance with developing contacts with relevant government agencies and NGOs in the region. However, development of the plan is likely to be a long and difficult process. The social research undertaken in this project has highlighted a number of different priorities within different sectors of the communities involved, and therefore developing a consensus about what the objectives of the plan should be is likely to require an intensive period of discussion within the communities themselves. The communities have their own decision-making structures, which move at their own pace, and forcing the issue is likely to prove counter-productive. The relationship between rural communities and local government representatives is also something that will need to develop over time, being

subject to a highly dynamic political environment that is common to much of rural Mexico.

In a sense, therefore, the project reached its limit. It is asking a great deal of a biophysical research team to reach out into areas of social research as much as CIIDIR achieved within this project. To go beyond that, and essentially to engage in rural development activities with the communities, would appear to be beyond the capacity of the CIIDIR team at the present time. They cannot be faulted for effort, but the level of capacity building that this project could provide was not sufficient to achieve a genuine integration of research and development planning. The long-term solution is likely to lie in the strengthening of CIIDIR staff, by appointing new personnel with appropriate social skills and experience, and it is encouraging to see progress in that direction. However, one of the lasting impacts of the project in terms of the team at CIIDIR will be a closer working relationship with local communities in future, and without doubt, improved communication between researchers and community representatives.

As a postscript, it is worth noting that this Darwin Initiative project did, however, act as a catalyst for a genuine integrated research and development project. Following the visit to Oaxaca by Marshall, and the communities at El Rincon, valuable links were made not only with community organisations, but also a number of local NGOs. Some of these NGOs are very active in supporting local communities in the sustainable management of forest resources, and as a result, a new project was developed as a partnership between the NGOs, community organisations and the UK partners of this project. The project was successful in attracting financial support from DFID, and focuses on exploring the factors influencing success of commercialisation of non-timber forest products (NTFP). This major international project has been very successful, and has included a substantial programme of socio-economic research, relating to forest use by communities in the Sierra Norte of Oaxaca. While CIIDIR has not been a significant partner in this project, the student who received training under the Darwin project has been directly involved in the NTFP project, facilitating an institutional link.

The lessons for other Darwin Initiative projects might be summarized as follows:

- The integration of biodiversity research with rural development is very challenging. Darwin projects should not be too ambitious in this area. The Initiative should arguably be content with delivering high-quality biodiversity assessment and research outputs, and ensuring that these are made available to relevant decision-makers, rather than aiming to achieve a direct impact of such research on the wellbeing of local communities
- It is important to recognise the limitations of host country partners, even where the objective of the project is primarily capacity building. In other words, there are limits to how far their capacity can be built within a three-year project such as this. The Initiative should arguably be content with achieving an increased awareness of socio-economic issues among biophysical research teams, rather than attempting to convert such teams into integrated research and development institutions. In the current project, the host partner researchers were genuinely keen to see the results of their research used by local communities, and the UK staff inputs were designed to assist them achieve this objective. However, as awareness increased among the host partner

research team of the difficulties of interacting both with local communities, and the local government / NGO community, they began to feel uncomfortable with their developing role, and wished instead to focus on their core area of expertise - scientific research.

- It is important to recognise that rural development is a highly political process, and often subject to much conflict, both within rural communities and between such communities and other actors within a region. Darwin Initiative projects must avoid placing host partner organisations in politically difficult situations, for example if the local communities wish to use the outputs of the research for some essentially political agenda. Such an eventuality could place the scientific objectivity of Initiative projects at risk. Again, this is an argument for Initiative projects to focus on delivering high-quality scientific outputs, and leaving the rural development aspects to specialists with appropriate skills. In an area such as Oaxaca, where so many rural development NGOs are active, there is undoubtedly a need for increased emphasis on biodiversity research, as many of the development decisions being made are based on very limited information.

10. Darwin Identity

The Darwin Initiative logo was displayed on the project vehicle, and on all reports, CD ROMS, websites and other outputs produced by the project. Some press coverage was generated by the project, which referred to the Initiative, increasing awareness among the host country. It should also be noted that this project was an independent initiative and did not form part of a larger project. All the project activities were therefore clearly identified with the Darwin Initiative 'brand identity'. It was therefore very much a distinct project with a clear identity. Ironically, as the 'catalyst function' of the project was so successful, in generating other research projects in Oaxaca, this clear branding will not be so easy to achieve in future. This raises the interesting point that the impact of Darwin projects is likely to be greatest in situations such as this, where the Darwin project is the very first internationally funded project of a particular research team.

11. Leverage

As mentioned earlier, this project was outstandingly successful in acting as a catalyst for generating additional research projects. Two large-scale, multi-disciplinary projects were developed directly as a result of the Darwin project, each totalling \$1 million in value. These projects were:

- 'Commercialisation of non-timber forest products: factors influencing success'. DFID FRP
- 'Biodiversity conservation, restoration and sustainable use in fragmented forest landscapes' (BIOCORES), EC INCO programme.

UK staff were therefore extremely successful in assisting host country partners to secure further funds for similar work from international donors. This role was greatly appreciated by the host country partners and is probably the greatest legacy of the Darwin project. The capacity of the host institution to lever additional funds from such donors has undoubtedly been massively strengthened.

12. Sustainability and Legacy

The CIIDIR research group continues to develop their research and training work initiated under the project, and this is likely to continue indefinitely, as the core staff are full-time employees of CIIDIR and very likely to remain so indefinitely. As research publications from the project appear in print, we anticipate that they will have a significant international impact, highlighting the particular value and importance of the research area. For example, the understanding of successional processes in cloud forests, and therefore the potential implications of human impact, have substantially progressed as a direct result of this project. The main legacy of the project, however, will undoubtedly be in the strengthened capacity of the host partner research group not only to undertake research and publish results, but to attract further funding from international donors. Essentially the project has launched the career of this research group.

The partners of the project continue to collaborate closely under the auspices of projects developed and research funds raised as a result of the Darwin project.

13. Value for money

We believe that the project was outstanding value for money. This was partly because the project budget was used primarily to support the field costs of staff and students, as well as training visits and workshops. The salaries, tuition fees, living expenses (etc.) were all covered from external sources (with the exception of some of the UK research staff). Essentially, an investment of approx. £65,000 has enabled an additional \$2 million to be raised for further research in the area. In addition, seven students have received training and have received postgraduate degrees. Staff of the partner institution have been empowered to undertake field research, and have (together with their students) delivered a series of research outputs of international standard. Results generated by the project will contribute significantly to the understanding of the dynamics of neotropical cloud forests, and their resilience to human disturbance. The conservation importance of the forests in the study area has been brought to a national, and increasingly an international audience. The host partner research team has also been able to strengthen substantially its links with other national and international research groups, which have enabled it to secure substantial funding to continue its work. In addition, the capacity of the research team to communicate with local communities, and support the sustainable management of native forests, has been significantly strengthened. All this has been achieved for less than the cost of training a single postgraduate student to PhD level in the UK.

Author(s) / Date

Dr Adrian Newton and Dr Rafael de Castillo, December 2002

14. 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 %	Article Description
6. General Measures for Conservation & Sustainable Use		Develop national strategies which integrate conservation and sustainable use.
7. Identification and Monitoring	19	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities which have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	10	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation		Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	3	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.

12. Research and Training	60	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).
13. Public Education and Awareness	2	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources	1	Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology	2	Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such access and joint development of technologies.
17. Exchange of Information	3	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Total %	100%	Check % = total 100

15. 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)	Detail (←expand box)
Training Outputs		
1a	Number of people to submit PhD thesis	1
1b	Number of PhD qualifications obtained	
2	Number of Masters qualifications obtained	2
3	Number of other qualifications obtained	5
4a	Number of undergraduate students receiving training	2
4b	Number of training weeks provided to undergraduate students	6
4c	Number of postgraduate students receiving training (not 1-3 above)	
4d	Number of training weeks for postgraduate students	350
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification(i.e not categories 1-4 above)	1
6a	Number of people receiving other forms of short-term education/training (i.e not categories 1-5 above)	4
6b	Number of training weeks not leading to formal qualification	16
7	Number of types of training materials produced for use by host country(s)	1
Research Outputs		
8	Number of weeks spent by UK project staff on project work in host country(s)	12
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (s)	1
10	Number of formal documents produced to assist work related to species identification, classification and recording.	
11a	Number of papers published or accepted for publication in peer reviewed journals	4
11b	Number of papers published or accepted for publication elsewhere	2
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country	1
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	
13a	Number of species reference collections established and handed over to host country(s)	
13b	Number of species reference collections enhanced and handed over to host country(s)	1

Dissemination Outputs		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	2
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	8
15a	Number of national press releases or publicity articles in host country(s)	
15b	Number of local press releases or publicity articles in host country(s)	2
15c	Number of national press releases or publicity articles in UK	
15d	Number of local press releases or publicity articles in UK	
16a	Number of issues of newsletters produced in the host country(s)	
16b	Estimated circulation of each newsletter in the host country(s)	
16c	Estimated circulation of each newsletter in the UK	
17a	Number of dissemination networks established	
17b	Number of dissemination networks enhanced or extended	1
18a	Number of national TV programmes/features in host country(s)	1 (video produced)
18b	Number of national TV programme/features in the UK	
18c	Number of local TV programme/features in host country	
18d	Number of local TV programme features in the UK	
19a	Number of national radio interviews/features in host country(s)	
19b	Number of national radio interviews/features in the UK	
19c	Number of local radio interviews/features in host country (s)	
19d	Number of local radio interviews/features in the UK	
Physical Outputs		
20	Estimated value (£s) of physical assets handed over to host country(s)	£18000
21	Number of permanent educational/training/research facilities or organisation established	
22	Number of permanent field plots established	20
23	Value of additional resources raised for project	£160,000

16. Appendix III: 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

Paper title	Author(s)	Type	Status	File attached
En el país de las nubes	Del Castillo, R.F.	Magazine dissemination	Published	papers\NUBES.pdf
Changes in epiphyte cover in three chronosequences in a tropical montane cloud forest in Mexico.	Cordova J, and R.F. del Castillo	Scientific	Published	papers\lifeforms.pdf
Ethnobotanical Notes on <i>Pinus strobus</i> var. <i>chiapensis</i>	del Castillo, R.F. and S. Acosta.	Scientific	In press	papers\ETHNO.DOC
Clasificación del Suelo de Bosques mesófilos Secundarios de diferentes edades, El Rincón, Sierra Norte-Oaxaca	A. Bautista Cruz, M. C. Gutiérrez Castorena, R. del Castillo and J. Etchevers Barra	Scientific	In press	papers\articulo.doc
High population differentiation and low genetic diversity in <i>Pinus chiapensis</i> , a threatened Mexican pine, detected by RAPD and mitochondrial DNA markers	Newton, A. C., T. R. Allnutt, W. S. Dvorak, R. F. del Castillo, and R. A. Ennos.	Scientific	Published	papers\pinemolecular.doc
Genetic associations under mixed mating systems: The Bennett-Binet effect	Vargas, J. A. and R. F. del Castillo	Scientific (see comment in text)	Published	papers\ima.pdf

Proceedings and conferences derived from the Darwin Project

Hernández, Yuri, M. Briones-Salas, R. F. del Castillo, S. Lozano- Trejo 2002. Analisis de la comunidad de mamíferos pequeños en diferentes etapas serales de un bosque mesófilo de montaña en la sierra norte de Oaxaca. VI congreso Nacional de Mastozoología, Oaxaca de Juárez, México 21-25 de octubre del 2002.

[proceedings\COMUNIDAD DE MAMÍFEROS PEQUEÑOS.doc](#)

Bautista, C. M.A. Gutierrez Castorena, M.C., del Castillo, R:F: 2002. Changes in soil properties in three montane cloud forest chronosequences in Mexico. To be presented at the 2002 Annual Meeting of the Ecological Society of America, in Tucson, Arizona, August 4-9, 2002. [proceedings\bautista.doc](#)

Trujillo, A.S., del Castillo, R.F. Rivera G.R. 2002. Pine invasions in cloud forests: factors determining seedling regeneration in a secondary tropical pine. To be presented at the 2002 Annual Meeting of the Ecological Society of America, in Tucson,

- Arizona, August 4-9, 2002. [proceedings\Trujillo.doc](#)
- Negrete. S.Y. 2002. ¿Se cumplen las hipótesis del seguro biológico para la biodiversidad? El caso de los microinvertebrados del suelo en un bosque mesófilo de Oaxaca. Instituto de Ecología Xalapa Veracruz, México. 22 de mayo del 2002 [proceedings\negrete.jpg](#).
- Negrete. S.Y., Fragoso, C., William, H.O., Newton, A. 2001. Do successional changes in aboveground environmental conditions lead to a parallel succession in soil macrofaunal communities? Abstracts of 86 Annual Meeting of the Ecological Society of America, Monona Terrace, Madison, Wisconsin, p. 323 [dissemination\negretabs.pdf](#).
- Bubb, P. 2001. Componentes del desarrollo sustentable una visión holística. conference May 24th, CIIDIR Oaxaca, México [proceedings\philipconf.jpg](#)
- Del Castillo, R. F., A. Bautista Cruz, A. Blanco Macías, M.A. Briones Salas, J. Cordova, Velázquez y R. Rivera. 2001. Bases ecológicas para un manejo sustentable del bosque mesófilo de montaña : bioindicadores y dinámica sucesional ante el disturbio I. VI Foro Estatal de Investigación Científica y Tecnológica. SIBEJ CONACyT. 10 – 11 Diciembre 2001. Instituto Tecnológico de Oaxaca Memoria pp. 77-78. [proceedings\foro2001.pdf](#)
- Del Castillo, R.F. A. Bautista Cruz, A. Blanco Macías, M.A: Briones Salas, J. Córdoba Velázquez y R. Rivera. 2000, Bases ecológicas para un manejo sustentable del bosque mesófilo de montaña, bioindicadores y dinámica sucesional ante el disturbio. V Foro Estatal de Investigación Científica y Tecnológica, Memoria, 11-12 de diciembre 2000, Oaxaca. [proceedings\foro2000.pdf](#)
- Trujillo, A.S. del Castillo, R.F., Newton, A.C. and Allnutt, T.R. 2000. Genetic diversity in the endangered pine *Pinus chiapensis*, British Ecological Society. 2000 special symposium. Plants stand still but their genes don't: integrating ecological and evolutionary process in a spatial context. Royal Holloway College, Egham, UK 21 – 31 August 2000. P. 26. [proceedings\britishecol2000.pdf](#)
- del Castillo, R.F., S. Trujillo, N. Sánchez y R. Rivera. 1999. Comparing restricted vs. Widespread populations of the same species: studying the causes of extinction in *Pinus*. XVI International Botanical Congress Abstracts. St. Louis.U.S.A. 504. [proceedings\MISSOURI.jpg](#)
- Bautista-Cruz, A., R.F. del Castillo, y R. Rivera. 1999. Changes in soil properties in three chronosequences in a montane cloud forest of Sierra Norte, Oaxaca, Mexico. XVI International Botanical Congress Abstracts. St. Louis.U.S.A. 523. [proceedings\MISSOURI.jpg](#)
- Cordova, J., R.F. del Castillo. 1999. Epiphytes cover in diverse successional stages of a cloud forest in the Sierra Norte of Oaxaca. . XVI International Botanical Congress Abstracts. St. Louis.U.S.A. 550. [proceedings\MISSOURI.jpg](#)
- Bautista Cruz, M.A. y R. F. del Castillo, R. Rivera 1999. Dinámica de los nutrientes del suelo en las diferentes etapas sucesionales de un bosque mesófilo de montaña. 29^o Congreso Nacional de la Ciencia del Suelo. La Investigación Edafológica en México. Tapachula de Córdoba y Ordóñez, Chiapas. 27p. [proceedings\QUIMSUELO.jpg](#)

of Species through the project Biodiversity, conservation and sustentable use in a Mexican cloud forest.

Author(s)	Title	File
R.F. del Castillo S. Trujillo	Estudio demográfico de <i>Pinus chiapensis</i>	\reports\Estudio demográfico de Pinus chiapensis.doc
Rafael F. del Castillo Salvador Acosta Castellanos Alejandra Blanco Macías Raúl Rivera García	Inventario florístico de El Gavilán	\reports\Inventario florístico de la zona de El Gavilán.doc
R.F. del Castillo Raúl Rivera García	Propuesta De Area Natural Protegida El Gavilán, Sierra Norte, Oaxaca, México	plan de manejo\propuesta.doc
R.F. del Castillo	Usos Maderables Potenciales del Bosque Mesófilo de Montaña de El Rincón.	reports\timbersp.doc
Elaine Marshall and Janette Córdova	Field study of forest resource use patterns in the community of Juquila Vijanos, in el Rincon, in the sierra norte of Oaxaca, Mexico	reports\forestresource.doc

Reports, papers, manuscripts or thesis derived from which have contributions to the biodiversity of the study area.

Report type	Title	Organism
thesis	The multivariate relationship between the diversity of soil macrofauna community and changing environmental conditions along a chronosequence of Cloud Forest in Oaxaca, Mexico	soil macrofauna
report	Ecología de comunidades de pequeños mamíferos terrestres en tres cronosecuencias de bosque mesófilo de montaña en Oaxaca, México.	Small mammals
report	Inventario florístico de El Gavilán	Vascular plants
thesis	Análisis sucesional en el bosque mesófilo de montaña en el Rincón, Sierra Norte de Oaxaca	Vascular plants
paper	Changes in epiphyte cover in three chronosequences in a tropical montane cloud forest in Mexico.	Vascular plants/cryptogams
report	Inventario florístico de El Gavilán	Vascular plants
thesis	Estudio de la variación genética de <i>Pinus chiapensis</i> (Mart.) Andresen a través de métodos electroforéticos	Genetic variation of <i>Pinus chiapensis</i>

17. Appendix IV: Darwin Contacts

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

**Note: this grant was awarded to the University of Edinburgh. During the project, the coordinator changed employer, leaving Edinburgh for UNEP WCMC, Cambridge. The project continued to be administered by Edinburgh but Newton continued to act as coordinator (at no cost to the project). Therefore, communication about the project should technically be directed through Edinburgh. However, current contact details for Newton are provided below.

Project Title	Biodiversity Conservation and sustainable use in Mexican cloud forest
Ref. No.	162/8/076
UK Leader Details	
Name	Dr Adrian Newton
Role within Darwin Project	Coordinator
Address	UNEP WCMC, 219 Huntingdon Road, Cambridge, CB3 0PA
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	
Role within Darwin Project	
Address	
Phone	
Fax	
Email	
Partner 1	
Name	Dr Rafael del Castillo
Organisation	CIIDIR
Role within Darwin Project	
Address	Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional - Unidad Oaxaca, Calle Hornos No. 1003, Santa Cruz Xoxocotlán, Oax. C.P. 71230. México.
Fax	
Email	
Partner 2 (if relevant)	
Name	
Organisation	
Role within Darwin Project	
Address	
Fax	
Email	