1. Darwin Project information

Project title: Propagation, Nursery and Establishment Protocols for Seychelles Endemic Plants.

Countries: UK and Seychelles

Project Reference No.: 162/10/006

Grant Value: 2001/2002 - £ 42,320 2002/2003 - £ 29,400

Start/ Finishing dates: April 2001 – April 2003

Reporting Period: 1/4/2001 – 31/3/2002

2. Project background

This Darwin project is located on Mahé Island, Seychelles, Indian Ocean. The organisations involved in the Seychelles include the Ministry of the Environment and Transport, Victoria Botanical Garden, Barbaron Biodiversity Centre, the National Parks Section of the Department of Forestry, Seychelles Island Foundation and the Plant Conservation Action Group, and in the UK the Eden Project.

This project has bridged knowledge gaps in methodologies and practices in biodiversity protection in the Seychelles by solving key technical problems, including information retrieval and developing practical skills.

The conservation problems this project sought to address were identified through collaborative work previously carried out by Tony Kendle and Frauke Fleisher- Dogley on the conservation and sustainable use of the Seychelles Coco-de-Mer and through staff training carried out by Tony Kendle at Victoria Botanical Gardens. The establishment of the Barbarons Biodiversity Centre for the development of ex-situ conservation and reintroduction initiatives for vulnerable and rare endemic plants further reinforced the view that the major barrier to success was the lack of information and capacity for developing propagation protocols.

3. Project Summary

Project purpose:

To produce protocols for effective propagation and nursery culture suitable for recovery programmes for 90% of the Seychelles endemic flora and to build the skills and capacity to needed to manage these programmes.

Project Outputs:

Database of propagation protocols for 90% of the Seychelles endemic flora, incorporating a review of known success and species recovery procedures for the endemic flora and results of trials on propagation methods.

See Appendix IV for the logical framework for this project

- Handbook of best nursery practice including a review of best establishment practices.
- Training courses to build capacity for the implementation of conservation programmes.
- Trials on endemic species establishment.

In the first year Richmond Dutton was substituted for Phillip Macmillan- Browse due to illness, Darwin were notified.

Project contribution to Articles under the Convention on Biological Diversity:

8. In-Situ Conservation

9. Ex-Situ Conservation

12. Research and Training

13. Public Education and Awareness

This project has been successful and we have achieved propagation answers to 90% of the endemic flora and significantly contributed to the overall sustainability of plant conservation in the Seychelles. We have achieved several additional outputs in raising the profile of species conservation on these islands and supported a dedicated and capable group of individuals in bearing the responsibility of safeguarding this unique biodiversity.

4. Scientific, Training and Technical Assessment

Training and Capacity Building Activities

Trainees were identified from staff employed within different Ministry of the Environment departments these included the Barbarons Biodiversity Centre, Victoria Botanical Garden, National Forestry section, National Parks Section and some representatives from local NGO's: the Seychelles Island foundation and Birdlife International. Trainees were selected by their role in these institutions, with a view to the expansion of their conservation-based responsibilities. Trainees were deliberately selected from both government and non-government institutions to encourage closer working relationships in conservation activities. The long-term benefits of the training programmes will be assessed through the staff appraisal scheme and all courses were accredited by the Ministry of the Environment.

Training programme content

Capacity building was approached at two levels. The primary training programme was aimed at people working at ground level and covered basic skills and practices of propagation. The secondary training programme was carried out as one-to-one mentoring in key aspects of nursery management for staff in charge of managing the conservation collection.

Training session 1: Seychelles 17th –25th September 2001

Programme 1

Course title: Basic skills and Practices of Propagation Techniques

Background: Although most endemic plant propagation will be from seed, vegetative propagation is also an important option when populations are of a very small size and need to be increased rapidly when seed set is poor.

Course components	**Group No. / Level / institution**	**Darwin Team**
Production of plants from seed	12 Technical GOV- Barbarons Biodiversity Centre, Victoria Botanical Garden, National Parks Department, Forestry Department.	Peter Thoday Alistair Griffith
Production of plants from softwood cuttings		" "
Production of plants from semi-hardwood cuttings		" "
Production of plants from hardwood cuttings		" "
Post-propagation potted plant management		" "

This training programme was attended by staff from the Botanical Garden, Barbarons Biodiversity Centre, National Park and Forestry Rangers. These participants were selected by their line managers and were chosen because of their role in conservation propagation within the department of the environment. Endemic plants are collected and propagated by more than one government department. It was thought that bringing these people together under the umbrella of the Biodiversity Centre would be beneficial in terms of consistency in capacity building, and reinforce the importance of departmental co-ordination.

Training session 1: Seychelles - 17th-25th September 2001

Programme 2

Mentoring programme theme: Nursery management

Thematic components	GroupNo./ Level/ Institution	Darwin Team
Development of nursery facilities and day to day running of a good nursery	1 Manager GOV –Barbarons Biodiversity Centre, Victoria Botanical Garden	Peter Thoday
Equipment handling		
Pots and Media		
Watering		
Health and safety		
Hygiene		
Pest and Disease Management		
Stock Control		

This mentoring programme was aimed at providing the support for the Barbarons Biodiversity Centre nursery manager. The nursery manager was identified as a key member of staff with many key roles in the propagation network, from species identification, seed collection and storage, technical aspects of propagation and post-propagation management, and general aspects of running the nursery such as day to day staff and budgetary management. This programme has helped the nursery manager to build up a good working relationship with our consultant Peter Thoday and the nursery manager has been encouraged to request advice whenever it is required. This programme incorporated a cascade training approach. It is envisaged that the nursery manager will be responsible for maintaining capacity in the long-term. This programme was considered to be fundamental to the sustainability of the project.

Training session 2: Seychelles 20th –30th November 2001

Capacity building in training session two was aimed at people working at ground level across a range of conservation agencies. This round of training provided a conservation context to the previous training courses by identifying external roles, responsibilities and support for the nursery propagation programme.

Course Title: External roles to nursery conservation propagation programmes

Background: There is a wide ranging network of people connected to the nursery who have a direct impact on the input and output of nursery production of plant material for conservation.
This course was designed to strengthen external support for nursery production with particular attention to collection, species recovery and establishment.

Course components	**Group no./Level/ Institutions**	**Darwin Team**
1: Designing field collection and survey cards for use in the nursery propagation programme	15 Technical, Ranger, Guide GOV – Barbarons Biodiversity Centre, Victoria Botanical Garden, National Parks Department, Forestry Department NON- GOV – Seychelles Island Foundation, Birdlife International	Tony Kendle Juliet Rose Kate Lloyd-Bostock, Peter Whitbread-Abrutat
2: Identifying areas suitable for monitoring, establishing micro-reserves and networked conservation areas		
3: Prioritising species recovery strategies, re-introduction status and interactions with ex-situ propagation programmes		
4: Estimating population size of key species, identifying re-generation.		
5: Ecological Restoration strategies		

This training programme brought together people from both government and non-government organisations to maximise capacity. Localised issues affecting the nursery production of plant material and the wider conservation network were discussed. This programme identified many fragmented elements in the current approach to conservation propagation and explored some of the issues and roles that needed to be addressed to make this more cohesive. The attendees were well selected and included people directly involved in propagation as well as people with an indirect role to play such as database management, seed collection, and plant establishment. The participants were clear in

their thoughts on candidate species for recovery and eager to establish a working conservation network to action all the necessary steps to make this a success. This programme produced a preliminary species recovery programme for review by departmental directors.

Training Session 3: UK 8th –18th February 2002

Mentoring Programme theme: Nursery Management and Advanced Technology for Conservation Propagation.

This programme was based at the nursery facilities at the Eden Project and supplemented by study visits to other nurseries. The nursery manager has been able to pass on the methodologies and techniques acquired during this training to additional staff members at the Barbarons nursery as intended. This has expanded the overall nursery skills base and improved operational standards.

Training components	Group no. / level / Institution	Darwin Team / site visit
Production of tropical plants for botanical exhibits. Trial propagation of Seychelles Endemic plants.	1 Nursery Manager Barbarons Biodiversity Centre	Peter Thoday Juliet Rose Alistair Griffiths Eden Project Watering Lane Nursery
Duchy Nursery –General production of woody plants and propagation techniques		Duchy Nursery Cornwall
Specialist propagation of woody plants from seed		Oakover Nursery Kent
Propagation of trees shrubs and herbaceous plants.		Hillier Nursery Ltd. Wiltshire
Advanced technology in vegetative propagation and nursery management. Large scale seed germination and softwood cutting production.		Guernsey Clematis Ltd. Guernsey

Training Session 4: Seychelles 25th February—6th March 2002

Course Title: Nursery Design and Propagation and Plant Production

The fourth training programme was carried out in an advisory capacity addressing the wider role of the nursery within the context of Barbaron Biodiversity Centre. The contributions that can be made to plant conservation through the production of plants for educational exhibits were considered and specific technical problems were identified.

Course components	**Group no./ Level/ Institutions**	**Darwin Team**
Technical issues Drainage Transplant recovery and care Field collected seedling recovery Polythene propagation facilities for leafy cuttings	2 Nursery Manager Director of Botanical Gardens GOV Victoria Botanical Garden	Peter Thoday Richmond Dutton
Soil storage, mixing and potting area Composting and raw materials		
Propagation material Mother plant hedges Coppicing/ pollarding insitu Transplanting container grown nursery stock		
Production policy Calculating production demand		
Plant use within the Biodiversity Centre Ecological areas Mother plants Reference collection Landscape use Educational exhibits		
Biodiversity Centre Design Path alignments and surface finish on beds Conservation of existing artefacts Labour demands Site surrounds Exotic flora		

Training Session 5 Seychelles 2nd – 11th August 2002
Darwin Team: Tony Kendle, Juliet Rose, Jane Stoneham

This training session was carried out in an advisory capacity focused on particular individuals with specific roles to play in the sustainability of the project. The main purpose of this session was to monitor progress made at the nursery in particular to assess the impact of the UK mentoring programme undertaken by the nursery manager and assess information collection. Existing problems and issues arising from the propagation tasks were discussed. Time was also spent establishing the possibilities for database management and responsibilities and how and its implementation in terms of staff development.

Darwin Team members also met with the French Attaché to the Seychelles Ministry of the Environment and the Senior National Parks Officer to discuss our work and its impact. This meeting was extended to include the Director of Forestry which enabled us to discuss how the techniques and practices in place at the Barbarons Biodiversity Centre could be extended to some of the forestry nurseries to help support forestry policy and planning initiatives.

This session was also spent establishing local partnerships with other institutions and establishing the role of the nursery in supporting conservation activities outside its own government department, notably the Seychelles Island Foundation which is responsible for managing the Vallee de Mai protected area. Members of the Darwin team took part in the first official meeting of the new NGO – the Seychelles Plant Action Group. Here Darwin team members where able to offer direct input into planning potential partnerships and shared objectives in the development of the new NGO.

Training session 6: Seychelles 5th – 25th April 2003
Darwin Team: Alistair Griffith, Emma Mansfield
This trip was carried out to hand over the database. A presentation of our project work was made for our project partners and attended by members of the Ministry of Environment, Principal Secretary for the Environment, Director of Tourism, Director General of Nature Conservation, National Parks Rangers, Director of Botanical Gardens, and the Local Press.

Partnership work with the Nature Protection Trust Seychelles was carried out to help ensure the sustainability of the project and included a visit to Silhouette Island to look at in-situ monitoring and sample collection of *Impatiens gordonii*.

In-situ monitoring and evaluation of some endemic populations, *Medusagyne oppositifolia* and *Impatiens gordonii* was carried out to assess the conservation status, threats and the effectiveness of collection techniques. These species had been identified

as flagship species for species recovery during the training courses carried out the previous year.

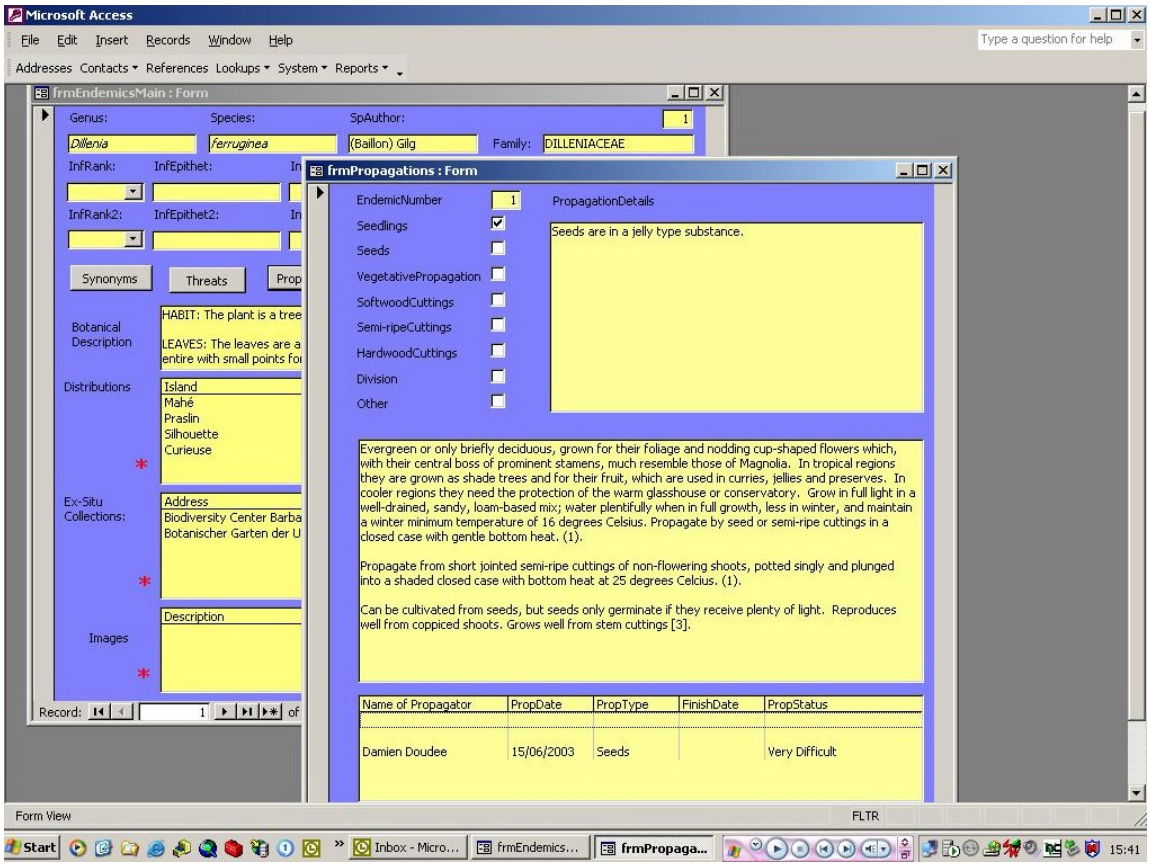
More seed was collected and brought back to the UK to extend propagation trials held at watering lane nursery.

The Darwin Team met with researchers working on the impact of invasive species on Seychelles endemic biodiversity from the Geobotanisches Institute, Zurich to discuss how best we could collaborate and share results to help our host partners in the Seychelles. We have already been able to support the work on invasive plants by improving the capacity of nursery staff support and facilities for their experiments on invasive plants. We hope to extend this partnership through collaboration on a Red Data Book for the Seychelles.

Research

We have reviewed known research on the propagation of the Seychelles endemic flora. This included submitting a questionnaire to Botanical Gardens to assess their collective propagation growing experience of the Seychelles plants held within their living collections. The aim of this information gathering exercise was to consolidate useful propagation strategies for our work in the Seychelles and to be able to highlight other institutions with some experience in growing Seychelles plant species. Ultimately it is hoped that we will be able redistribute the findings to other botanical gardens to help improve the propagation and cultivation of Seychelles endemic plants in all ex-situ living collections throughout the world.

We have run trials on the most effective propagation methodologies for each species. Trials included sexual and asexual propagation across a range of media and environments. The most successful and preferably the most achievable methodologies for a given species were recorded in the database of propagation protocols.



Information format as recorded on the Database

We used the following techniques and approaches to maximise diversity in the propagation of Seychelles island plants:

- Collecting plant material at different times to maintain genetic diversity, even if some trips seemed relatively unproductive.

- Ensuring all individual seedlings or cuttings were propagated equally even when some appeared to be stronger/ healthier than others.

- Record keeping at the point of plant material collection through to establishment and good nursery stock control.

We are giving ongoing support to more detailed research to improve our understanding of the reproductive biology of particular Seychelles endemic species by using hi-tech solutions to propagation including genetic studies (Amplified Fragment Length Polymorphism), breeding experiments, and viability and survivorship analysis on selected problematic species.

Research has involved staff at every level, from nursery staff to the managing directors at both the Barabarons Biodiversity Centre and the Eden Project. More detailed trials have been led by Alistair Griffiths at the University of Reading and the Eden Project's Watering Lane Nursery.

Nursery Manager Damien Doudee with propagated endemic species at the Barbarons Biodiversity Centre, Mahé, Seychelles.

Seedlings of *Medusagyne Oppositifolia* growing at the Eden Project's Watering Lane Nursery.

Following our field work on *Impatiens gordonii* we have been able to classify this species as critically endangered. During the training sessions this species was identified as a primary candidate for a species recovery programme. Further work on this species has revealed that one of the populations on Mahé is displaying a deformed flower spur, possibly the result of genetic depression. This has serious consequences for the sexual reproduction of the population. In addition many of the plants displayed stem roots a form of clonal recruitment that may exacerbate detrimental genetic characteristics. These are serious issues for the recovery of particular populations of this species but the investigation and decision making processes that forms part of this work is proving to be an invaluable example in the learning and teaching experience.

The Jellyfish Tree (*Medusagyne oppostifolia)* was previously thought to be one of the more difficult endemic species to propagate. Critically endangered in the wild and popular locally due to its small jellyfish like seed heads, concern for this species was

raised several times during the training sessions. The Botanical Gardens at Mahé, Kew, Bern and Nancy have all attempted to grow this species, but with limited success. It was suspected that this was due to the death of seedlings from damping off diseases. Even the seedlings that germinated and survived the damping off were thought to grow very slowly and look unhealthy. This may have been due to a lack of knowledge on the specific growing medium requirements or in the past the trees from that the seeds have been collected from are so old or genetically degenerate that they are producing poor seedlings with unhealthy growth.
In the wild, little natural generation is known to occur and those trees that produce the seeds are very old/mature specimens that cast their seeds on a very hospitable seedbed below. Indeed, the Jellyfish tree has been of interest to many botanists and has been included in several scientific studies which have examined the molecular systematics and floral affinities of this tree with regard to which plant family it is most closely related to. Other studies have mentioned its rarity, but very few have provided notes on how to cultivate it. To date no one has done an in-depth investigation using cultivation trials to determine how to successfully cultivate the Jellyfish tree in order to safeguard its future.

Experimental trials at Eden have significantly improved the germination and survival of this species by using a combination of ericaceous growing medium and fungicide treatment. This has been particularly well received by our project partners due to the popularity of this species.

We are preparing papers for peer review to disseminate our research that will include results from some of the more detailed research, carried out on the *Impatiens gordonii.*

5.0 Project Impacts

Our host country partner is now in possession of the necessary information for the effective propagation of 90% the Seychelles endemic flora. Project specialists confirm the ability of the staff at the Barbarons Biodiversity Centre and Victoria Botanic Garden to carry out this conservation work. The range, quality and number of endemic species propagated for conservation have all improved.

Conservation work carried out as a result of this project has provided a firm foundation for the Seychelles to meet its obligations to the Convention of Biodiversity. This project has been able to specifically address the following CBD obligations:

Article 8. In situ Conservation
Article 9 Ex situ Conservation
Article 12. Research and Training
Article 13 Public Education and awareness
Article 17. Exchange of information
Article 18. Technical and Scientific Co-operation

This project has sought to develop and strengthen the national capabilities of the Seychelles through human resource development across a range of government departments and NGO's. The project has effectively carried out programmes for the scientific and technical education and training for the identification and conservation of Seychelles biodiversity. Before the project started there was limited knowledge and capacity regarding techniques for the propagation and re-establishment of many of the endemic plant species. The project has help to fill in knowledge gaps regarding propagation, and set in motion the accumulation of information relating to more precise endemic species locations, numbers, and related threats. A Species Recovery Plan developed through the training programmes is being used to broaden the range of endemic plant species re-establishment. A new NGO has been established to help carry out and manage this work.

Provisions for training in the identification and monitoring of species have also been made. Training courses were aimed primarily at a technical level but were backed up by one-to-one mentoring of key staff in more senior positions to ensure training could continue post-project. The facilities and capacity for ex-situ conservation in the host country has been greatly improved as a result of this project.

Easily accessible mechanisms for assembling and organising biodiversity related data have been developed. A database of propagation protocols for 90% of the Seychelles

endemic flora will be accessible via the internet. It is hoped that this will encourage the effective sharing of information for the conservation of tropical island plants.

The main impact of the capacity building programmes has been to train 29 key individuals across a range of government departments and non-governmental organisations in techniques for the conservation and re-establishment of Seychelles endemic plant species. Several trainees have received greater responsibility in undertaking conservation work. All trainees continue to work in conservation and several are now members of the new NGO.
Two staff members instrumental in organising and contributing to the project have been promoted to Director of Tourism and Director General for Nature Conservation. Having these key people in such locally influential positions means that the opportunity for the implementation of the learning and research associated with project is very positive.

Work carried out as a result of this project has helped to raise the profile of the Barbarons Nursery as a specialist in raising native species. As a result the nursery has been entrusted with providing plant material for conservation programmes run by departments outside its own. In particular the provision of *Curculigo sechellensis* (Koko Maron) for a habitat restoration programme for the White Eye Bird.

The link between the Seychelles Island Foundation, Barbarons Biodiversity and Victoria Botanical Garden in particular has been improved and has seen the formation of new NGO with the capacity to manage larger plant conservation programmes and longer term initiatives. Most recently this new partnership has outlined plans to take on the conservation and management of La Reserve one the last remaining natural Palm forests on Mahé island.

The project has been a successful collaboration between the Seychelles Ministry of the Environment and the Eden project. The project has helped to consolidate and extend the collaboration on conservation work across government departments and between the government and local NGOs.

We have hosted numerous visits to Eden by people currently involved or in a position to influence and support our project in the long term. These have included:

Rolf Payet, Director General for Policy, Planning and Services, Seychelles Ministry of Environment
Ronny Jumeau, Minister of the Environment, Seychelles
Bertrand Rassool, Seychelles High Commissioner
Ron Gerlach, Nature Protection Trust Seychelles
Rosemary Wise, Seychelles Botanical Illustrator
Tropical Forest Resource Group
Raleigh International
Christophe and Eva Schumacher, PhD researchers at Geobotanisches Institut, Zurich on Seychelles Invasive plants.

This project has resulted in some very positive results for the local community. School children and wildlife clubs have been involved in planting and tagging over 1000 indigenous and endemic plants at the Barbarons Biodiversity Centre.

Staff associated with this Darwin project have also been involved in an environmental education programmes for schools. This programme was focused on teacher training for using the Botanical garden collections as an environmental resource.

Links between conservation and economic outputs are beginning to form. Tourists are increasing being brought to the biodiversity centre by local taxi drivers and staff at the Nursery have often had to act as impromptu guides to their work, which has been met with much enthusiasm and encouragement by the visitors. The Eden Project is drawing on its vast experience to develop the biodiversity centre content to help improve the visitor learning experience.

6.0 Project outputs

Appendix II Darwin Initiative standard output Measures
Appendix III details of publications

The database has been handed over to our project partners in the Seychelles. We are currently trying to agree a web format that is compatible for both Eden and the Seychelles. We are preparing hard copies of the handbook for which Eden will bear the cost of publication.

We have also attended three international conferences to promote this project: The Science for Plant Conservation, International conference for Botanical Gardens, Dublin, the European Society of Ecological Restoration Conference, Hungary, and the International Symposium on Society and Resource Management in Sardinia, Italy.

Eden staff are regularly required to give presentations and site tours to various institutions, societies and members of the general public about the Eden Project of which the Darwin work is used as an example of our overseas activities. These have included:

Dissemination activity	Details
Conference presentation	10/2002 Botanic Gardens and the Cities of Tomorrow. Valencia, Spain.
Conference presentation	6/2003 Science, Law and Society. Environmental Law Association. UK.
Conference presentation	5/2003 International Conference on Mining and Environment III, Sudbury, Canada.
Presentation and Site Tour	5/2003 London Diplomatic Science Club

On site at Eden we disseminate information about our Darwin work in several ways, primarily through the Tropical Islands exhibit where we showcase endemic species from the Seychelles. Eden also employs 30 guides that accompany visitors through each exhibit and relay more in depth information about each one. We have ensured that these guides are briefed on our project work and they are responsible for disseminating information regarding this project to the general public all year round. Currently Eden receives 1.8 million visitors a year. In addition to this we currently have on sale in the Eden shop a Botanical Print of *Impatiens gordonii*, profits from the sale of these prints will be used to extend and support plant conservation in the Seychelles.

Most recently work carried out for this project was included as part of a Life Long Learning exhibit at the May 2003 Chelsea Flower Show. Under the theme of species

recovery endemic species that had been propagated as part of our work were featured to illustrate the importance of biodiversity conservation. 5000 information packs were produced and distributed to the general public. Examples of this information is included in Appendix III

7 Project Expenditure

Year	Salary Budget	Salary Expenditure	Travel Budget	Travel Expenditure	Total Budget	Total Expenditure

Differences between budget and expenditure have been met by the Eden Project.

8. Project Operation and Partnerships

The primary project partner for this project was the Seychelles Ministry of the Environment. Within the Ministry of Environment specific project partners were the Botanical Gardens department, focussing on staff connected to the Barbarons Biodiversity Centre Nursery and the Forestry Department particularly staff from the National Parks Department.

Our primary partners were consulted in the project planning and contributed directly into the training programme course contents. Senior departmental members took part in the course implementation of the by attending some of the discussion groups that were held at the end of the training sessions. Research planning and implementation opportunities for building in additional outputs increased because of the promotion of key staff, the establishment of the new NGO and the increasing recognition of the value of the Eden-Darwin-Seychelles partnership among high ranking officials and the wider Seychelles community.

Partnerships have been made with 3 existing Seychelles NGO's that are responsible for a proportion of the Seychelles Biodiversity. The Seychelles Island Foundation, Birdlife International, and The Nature Protection Trust Seychelles have all been included in this project either through their inclusion in the training programmes or in consultation in planning for species recovery.

During the second year the project was able to extend its links with other Government departments through the promotion of key individuals to Director of Tourism and the Director General of Nature Conservation. Both Directors are keen to augment cross-sector plans, programmes and policies relevant to the conservation and sustainable use of Seychelles biodiversity.

We have met with Dave Robins of Plymouth Marine Laboratory, Project Manager for a Darwin Initiative project focusing on the Marine environment of the Seychelles and Mauritius. We have also met with researchers from the Geobotanisches Institut, Zurich working the impact of invasive species on Seychelles endemic biodiversity. We hope to extend this partnership through collaboration on a Red Data Book for the Seychelles.

We have also met with Darwin project co-ordinators of plant biodiversity based projects in other countries. We believe that maintaining these partnerships is beneficial due to the similar nature of our projects and the benefits that can be derived from sharing related knowledge and experience.

Partner: University of Reading
Country: Morocco
Project Title: Inventory of Moroccan Plants and the Conservation of priority species.

Partner: Horticultural Research International
Country: Thailand
Project Title: Education and Training for restoring tropical rainforest biodiversity

The local partnerships that have been formed between government departments and local NGO's throughout the duration of the project have remained active and have strengthened through the formation of the Plant Conservation Action Group. This group has become an important mechanism in the formation of new plant conservation initiatives in the Seychelles.

The establishment of a new N GO means there is more scope for environmental investment by the private sector. The private sector is set to play an essential role in the sustainability of conservation initiatives in the Seychelles. We believe that a key focus for future conservation work will be the strengthening of economic links to biodiversity protection. To this end we have been working with the Valle de Mai protected area and World Heritage Site to act as a flagship site linking biodiversity and tourism. When officially opened to the public the Barbaron Biodiversity Centre will provide a similar opportunity and we have been encouraging the involvement of the private sector. We are fostering the development of the means to access returns from the broader tourist industry and in order to sustain the resource they benefit from. The previous experience of the Director of Tourism as the Senior National Parks Officer is particularly beneficial in achieving this.

9. Monitoring Evaluation and Lesson Learning

We have set up an internal steering committee to monitor and advise on our progress.

Gus Grand –Partnership and Sustainability Co-ordinator

Peter Whitbread Abrutat – Science Project Manager

Ghillean Prance – Director of Science

External monitoring and advice for this project has been provided by Tim Upson, Curator,University of Cambridge Botanical Garden.

Baseline monitoring has been carried out in recording the numbers of species with propagation answers. Monitoring and evaluation for the project was carried out by all Eden team members when visiting the host country and by senior host team members between visits. Project reports by project specialists were completed after each visit to keep track of progress and flag up any problems, issues, or needs arising. This was particularly useful in our preparation for subsequent visits and enabled us to provide extra equipment such as pH meters, compasses and a GPS system from Eden funds. Species collection, fruiting and flowering has all been monitored through the collection forms developed through the training programme.

In general terms we would have found more information on match funding useful especially with regards to ways to involve the UK private sector in overseas biodiversity projects.

One key lesson we learnt was the value of political and public activity in the promotion of conservation research. Conservation projects need to engage politicians and communities more effectively to ensure their long-term success.

10. Darwin Identity

The Darwin Logo has been used on all the certificates awarded to Trainees.
The Darwin logo has been used at all the conferences where we have presented our project work, on the conference posters and within the presentation itself. On site at Eden the Darwin logo has been displayed in our Visitors Centre for the duration of the project and the Tropical Islands exhibit is accompanied by written information in the Eden Visitors Guide which mentions our Darwin Initiative project work. To date we have sold 800,000 copies of the Visitors Guide.

The Darwin initiative is featured on the information material produced for the Chelsea Flower Show exhibit, and the postcard of the Seychelles endemic *Medusagyne oppositifolia* which is due to go on sale in the host country to raise money for the new NGO features the Darwin logo.

The Darwin identity is understood in the host country at many levels from the Principal Secretary of the Environment to the Nursery staff at the Biodiversity Centre. Numerous articles in the Seychelles National newspaper has helped to bring the Darwin Initiative to the attention of the Seychelles general public.

This Darwin project was the only conservation project involving and supporting the Barbarons Biodiversity Centre Nursery in the last two years and was recognised as a distinct project with a clear identity.

11.0 Leverage

During this project we attempted to lever support from the travel company Opodo.com to support the Plant Conservation Action Group. We discussed our work with the company and they were initially very keen to be involved as the Seychelles contributes significantly to their business. However sponsorship funds of this kind are held by the company's marketing department which has recently had its budget significantly reduced due to the impact of world events on travel and tourism. Although the company is currently unable to contribute to the extension of this project, they maintain an interest in being involved in the future.

Eden Project core funds have been used for several additional outputs to this Darwin Project. Eden has contributed £30,000 to the development of the Tropical Islands exhibit on site in the Humid Tropics biome of which the Seychelles Darwin Project occupies 40%.

The Coco de Mer Exhibit in the Humid Tropics Biome at the Eden Project.


Impatiens gordonii growing in the Tropical Islands Exhibit at the Eden Project.

This year in collaboration with the University of Reading, Eden featured some of the Seychelles Darwin work in an exhibit for the Chelsea Flower Show for which it received a Silver Gilt Medal. The total cost of the Chelsea flower show was £10,000 and included 5, 000 educational handouts and 10 000 promotional postcards for the conservation of the endemic *Medusagne Oppostifolia* (Jelly Fish Tree).

The endemic plant identification boards were produced using the illustrations of Rosemary Wise (author of the illustrated guide to the endemic plants of the Seychelles) for a cost of £1000 provided from Eden project core funds.

We have provided £2607 worth of propagation equipment from Eden core funds to the nursery to assist with the training and research at the Barbarons Biodiversity Centre. Free air shipment was obtained from Air Seychelles for the transport of propagation equipment to the Barbarons Nursery.

We are currently supporting a conservation based arts project with the artist Angela Easterling to follow in the footsteps of the botanical illustrator Marianne North by producing photograms of the Seychelles endemic flora. The aim of this project is promote the importance of the Seychelles biodiversity by extending its aesthetic value locally and internationally. Work from this project will form an exhibition and is accompanied by a short film. The cost of this project so far is £10,000.

We have advised on applications by the Victoria Botanic Garden to the British Ecological Society for funds to initiate an Indian Ocean plant conservation network.
We have supplied information on funding mechanisms with programmes specific or applicable to the Seychelles. As a result the Botanic Garden hopes to make an application to Seacology a non-governmental organisation who currently have a particular interest in the Indian Ocean and we will support this application. More recently the new NGO has levered $3,600 from the American Embassy for environmental education.

We believe it is important to foster social enterprise solutions to biodiversity support as well as donor funding. We are encouraging the development of merchandising and income generating ideas. The nursery plans to grow a small range of ornamentals for sale locally to help support its conservation work.

12.0 Sustainability and Legacy

The database will be regularly updated as our knowledge grows. The propagation skills that were initiated through the project are being maintained through locally-led staff training carried out by the Nursery Manager.

Support for the project by senior members of the Ministry of the Environment has been good. The project has gained capacity and information to improve the quality and extension of government funded work.

There has been an expansion of the non-government sector to attract external funding and broaden the range of conservation work needed. The enthusiasm and determination of the Plant Conservation Action Group to maintain conservation activities continues to grow and their success will be important in encouraging joined up thinking between government, non-government and the private sector and exploring new opportunities in the island's sustainability.

The project has impacted on and improved the linkages between, both government and non-government institutions. Although the environmental education course – "Using the Botanical Garden Collections as a resource" went some way to achieving this, legacy could have been improved by allocating more funds for the wider inclusion of schools and wildlife groups in the project.

We are convinced that the principles and approaches applied to this project have a much wider importance over and above the specific solutions that have been identified in the Seychelles. We feel it would be beneficial to expand the outputs of the handbooks to include general guidance for the wider network of conservation managers. This will be promoted as a Darwin handbook and disseminated through the Eden Project.

Currently we are not seeking additional funds but we aim to disseminate the outcomes to a broader audience than originally envisaged.

Further work is needed on strengthening capacity in new ways to attract funding particularly from the private sector. As the Seychelles is dominated by the tourist industry more could be done to explore the potential of stronger linkages between the private sector and local NGO's and the impact this could have on supporting conservation. To this end the design team at Eden is involved in designing the new NGO's logo.

13.0Post –Project Follow up Activities

N/A

14.0Value for Money

Given the number of additional outputs achieved and matched by significant funding from our organisation we consider this to be value for money.

15.0Appendix 1: Project Contribution to Articles under the Convention on Biological Diversity (CBD)

Article No./Title	Project %	Article Description
6. General Measures for conservation and Sustainable Use		Develop National Strategies which integrate conservation and sustainable use
7. Identification and Monitoring		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	40%	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		Integrate conservation and sustainable 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	30%	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	20%	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.
17. Exchange of information		Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge.

Total %	100%	

16.0 Appendix 11: Outputs

Project outputs using the coding and format of the Darwin Initiative Standard Output Measures.

Code	Total to date	Detail
Training Outputs		
6a	29	Trainees attending the training programmes
6b	5	9/2001 Seychelles Training programme 1: Basic Skills and Practices of Propagation Techniques. 9/2001 Seychelles Training programme 2: Mentoring in Nursery Management. 11/2001 Seychelles Training Programme 3: External Roles to Nursery Conservation Propagation Programmes. 2/2002 Seychelles Training Programme 4: Nursery Design, Propagation and Plant Production. 2/2002 UK Training Programme 1: Nursery Management and Advanced Technology for Conservation Propagation.
7	2	Content for review of nursery practice completed Plant Identification Boards produced for training and education in endemic plant species recognition.
Research Outputs		
8	8	Training weeks and consultant review
9	1	Species recovery plan produced for *Impatiens gordonii* , including other candidate species for recovery as part of the training programme
11a		Peer review journal articles are currently being prepared.
12a	1	Eden Project Seychelles exhibit for Coco-de-Mer

Dissemination Outputs		
14a	1	04/2003 Presentation to Ministry of the Environment Seychelles
14b	3	7/2002 Poster at Science for Plant Conservation, International Conference for Botanic Gardens, Dublin. 8/2002 Poster and Presentation at European Society of Ecological Restoration Conference, Hungary. 10/2002 Presentation at Intenational Symposium on Society and Resource Management in Sardinia, Italy.
15a	6	03/12/2001 *Nation* "Rangers, DoE staff follow plant recovery programmes" 21/12/2001 *Nation* "Seychelles cements ties with world famous Eden Project" 21/12/2001 *Nation* "Seychelles biodiversity of world importance says Eden" 02/2002 *Nation* "Local teachers get training on how to jazz up environmental education" 3/2002 *Nation* "VP Michel hails new environment plan" 04/2002 *Nation* "Conservation of Endangered Plant Species" 10/6/2003 *Nation* " Seychelles plants win big at Chelsea Flower Show"
15c	2	Press releases actioned but no uptake by national press.
15d	4	16/8/2001 *Cornish Guardian* "Conservation Award" 9/8/2001 *West Briton* " Scientists set to help Seychelles Forests" 16/2/2002 *Guernsey Press* "Island knowledge helps save Seychelles Flora" 28/6/2003 *Western Morning News* " Prestigious medal for Eden Scientists"
16a	3	*Eden Friends* Number 3 " *Impatiens Gordonii*" *Eden Friends* Number 6 "Another Eden" *Eden Friends* Number 10 "*Medusagyne oppositifolia*: an amazing survival from the Seychelles"
16c	20,000	Eden Friends Publication
18a	2	09/2001 *Seychelles T.V.* Interview with Peter Thoday 02/2002 *Seychelles T.V.* Interview with Jane Stoneham
18b	1	02 /01 *Einsteins TV* – Short feature on Island plants Alistair Griffiths and Juliet Rose
18d		Local T.V. Feature in preparation
19a	3	04/2003 *Seychelles Radio* Interview with Alistair Griffiths 11/2001 *Seychelles Radio* Interview with Frauke Dogley 02/2002 *Seychelles Radio* Interview with Peter Thoday
19b	1	09/2001 BBC Cornwall Interview with Tony Kendle
19d	1	02/2002 *Guernsey Radio* Interview with Peter Thoday and Damien Doudee
Physical Outputs		
22	3	Field plots established.

16.0Appendix 111: Publications

Type	Detail	Publishers	Available from	Cost £
Newsletter Article	Eden Friends Magazine "Another Eden" Tony Kendle and Juliet Rose	Eden Project Cornwall	Eden Friends Eden Project Bodelva St Austell Cornwall PL24 2SG	Free
Newsletter Article	Eden Friends Magazine *"Impatiens gordonii"*	Eden Project Cornwall	Eden Friends Eden Project Bodelva St Austell Cornwall PL24 2SG	Free
Newsletter Article	Eden Friends Magazine *"Medusagyne opppositifolia:* an amazing survival from the Seychelles.	Eden Project Cornwall	Eden Friends Eden Project Bodelva St Austell Cornwall PL24 2SG	Free

17.0Appendix 1V : Darwin Contacts

Project Title	Propagation, Nursery and Establishment Protocols for Seychelles Endemic Plants.
Ref. No.	162/10/006
UK Leader Details	Foundation Director, Eden Project
Name	Tony Kendle
Role within Darwin Project	Project Leader
Address	Eden Project, Bodelva, St Austell , Cornwall
Phone	
Fax	
Email	
Partner	Director General for Nature Conservation Seychelles, Barbarons Biodiversity Centre, Victoria Botanical Garden
Name	Didier Dogley
Organisation	Ministry of the Environment Seychelles
Role within Darwin project	Host project leader / partner
Address	Victoria Botanical Gardens, Victoria, Mahé, Seychelles
Fax	
Email	

Authors / Date

Juliet Rose , Tony Kendle , Alistair Griffiths