

## ***Darwin Initiative Annual Report***

### **Important note:**

To be completed with reference to the Reporting Guidance Notes for Project Leaders – it is expected that this report will be about 10 pages in length, excluding annexes

**Submission deadline 30 April 2008**

### **Darwin Project Information**

<b>Project Ref Number</b>	<b>16-012</b>
Project Title	Orchid Seed Stores for Sustainable Use
Country(ies)	Ecuador, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Guatemala, Mexico, China, India, Indonesia, the Philippines, Singapore, Thailand and Vietnam.
UK Contract Holder Institution	Royal Botanic Gardens, Kew
UK Partner Institution(s)	None
Host country Partner Institution(s)	Jardin Botánico de Quito, Ecuador; University of Cuenca, Ecuador; Universidad Tecnica Particular de Loja, Ecuador; BIOFAN, Universidad Autonoma Gabriel Rene Moreno (UAGRM), Bolivia; Agronomia Faculdade de Ciências Agrárias Universidade do Oeste Paulista – UNOESTE, Brazil; Banco Base de Semillas, Instituto de Investigaciones Agropecuarias (INIA), Chile; Jardín Botánico Nacional, Viña del Mar, Chile; Fundación Jardín Botánico de Cali, Colombia; Jardín Botánico Lankester, Costa Rica; Orquideario Soroa, University of Pinar del Río, Cuba; Universidad del Valle de Guatemala, Guatemala; Jardín Botánico, Universidad Autónoma de México; Sichuan Hengduan Mts Biotechnology, Chengdu, China; Kunming Institute of Botany, Yunnan, China; Beijing Botanic Gardens, China; Institute of Botany, the Chinese Academy of Sciences; Hainan University, College of Horticulture, China; Botanic Garden of Indian Republic (BGIR), India; Bogor Botanic Garden, Indonesia; Purwadadi Botanical Garden, Indonesia; Institute of Plant Breeding, College of Agriculture, the Philippines; Mahidol University, Thailand; Singapore Botanic Gardens, Singapore; Dalat Institute of Biology, Vietnam.
Darwin Grant Value	£ 220049
Start/End dates of Project	1 Oct 2007 to 30 Sept 2011
Reporting period (1 Apr 200x to 31 Mar 200y) and annual report number (1,2,3..)	1 Apr 2007 to 31 Mar 2008 Report No. 1
Project Leader Name	Prof. Hugh W. Pritchard
Project website	Currently under construction
Author(s), date	Philip T. Seaton and Prof. Hugh W. Pritchard. 28 Apr2008

## 1. Project Background

The need for a global network of orchid seed storage facilities for sustainable use was raised for the first time more than 20 years ago at the 11<sup>th</sup> World Orchid Conference (1984, Miami). This general need was re-iterated in the Orchids Status Survey and Conservation Action Plan of the IUCN/SSC Orchid Specialist Group (1996), which stated that "seed banking has great potential for orchid conservation because long-term seed storage will allow one to maintain an enormous array of species very economically." The *Action Plan* also recommends the sustainable use of germplasm through the "propagation of plants where possible from seed, usually in aseptic conditions" and that "orchid societies, establish and support *ex situ* propagation units in countries with high orchid biodiversity." The Proceedings of the Second International Orchid Conservation Congress (Sarasota, 2004) continued the call for conservation by proclaiming "that, by 2010, 90% of threatened orchids will be in *ex situ* collections" in support of Target 8 of the GSPC. This project aims to help reach that target. Whilst the threat to orchid species through, inter alia, habitat fragmentation and over harvesting is accepted to be of considerable concern, the exact number of orchid species (out of > 20000) that are threatened remains conjecture. This situation will change as in many of the countries with whom we have corresponded, including Ecuador and China, we understand that in-house red-listing of orchids is underway. Importantly, we have through discussion identified countries that cover many of the accepted biodiversity hotspots for orchid species. Indeed, our potential list of collaborating institutes / countries embraces thousands of orchid species. Although in many cases the countries do not have fully functional BAPs, the desire to support positive action on orchid conservation and sustainable use is absolutely clear from the supporting correspondence we have received (see above). In addition to responding to this overdue need for action, numerous other targets of the GSPC and CBD will be supported by this project .

## 2. Project Partnerships

The key host country partners are Ecuador and China, who will act as regional, scientific hubs and training sites; they with the other countries\* will undertake conservation activities (seed harvesting, storage), laboratory studies (including germination protocol development), maintain conservation collections, develop education programmes and disseminate outputs.

\* (Americas) Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Guatemala, Mexico;  
(Asia) India, Indonesia, the Philippines, Singapore, Thailand, Vietnam.

The UK partners will, inter alia, provide technical backstopping, offer back-up storage, act as the clearing house for orchid seed conservation biotechnology information, and manage the project.

## 3. Project progress

### 3.1 Progress in carrying out project activities

Both training workshops were delivered on time in the autumn of 2007 with the excellent input of Phil Seaton who only formally started as the Project Manager (0.3 x Band D) in Oct 2007. There is no doubt that Mr Seaton committed much of his own time during the pre-project phase to ensure that the workshops happened as planned. This level of support by Mr Seaton has continued unabated. In essence the workshops went without a hitch (see **evaluation under 2. below**); they were delightfully interactive and a real synergy was evident between the participants who enthusiastically shared their experiences. The Management Team is extremely confident of rolling this project out to other countries, subject to funding, as the enthusiasm to contribute to orchid conservation is tangible.

We got good press coverage at the opening of both workshops (in China and Ecuador). As planned, we have written numerous short articles this year 'announcing' the project, and this has been supported by five talks by Seaton and Pritchard promoting the project at three scientific conferences (in the UK, Ecuador and Thailand) and two research institutes (Ecuador, China). In addition, Dr Phil Cribb (formerly of Kew) promoted OSSSU at the World Orchid Congress in Miami early in 2008.

It was essential that the participants at the workshop contributed to the development of handling guidelines for the seed material. Through much discussion, we managed to achieve broad agreement in this area at both workshops

and the 'protocols' have now been distributed to all partners. Confidence was built during the workshop by reviewing some of the content of a book on growing orchids from seeds by Phil Seaton. Project funds were used to purchase copies of this book, at cost price, and these were given to all institutes / laboratories present at the workshops. The text of the book has already been translated into both Spanish and Chinese and we aim to publish both in Year 2 as planned. Finally, good communication has been maintained at the management level with regular email exchanges with the partners and Phil Seaton has been providing advice, sourcing some background publications, etc , i.e. acting as the 'clearing house'.

The draft MoU was not distributed beforehand but presented during the workshops. The discussions identified the need for greater clarification of 'terms'. Subsequent inputs from the legal departments of some institutes and Kew's resulted in the development of a much more substantial MoU (see **Annex**), which was distributed early in 2008. To date, eight countries have signed and the others are expected soon.

The web site has not been designed, as the MoU arrangements and annual report chasing was given priority. However, biopics have been requested of all the partners and flagship species for the project have been selected for promotion of the project and for web page production. A considerable amount of background and technical information is already available for uploading, as all workshop participants willingly offered material from their presentations at the workshop (NB this was distributed as electronic copy at the time to all present). In addition, partners have provided images of numerous orchids from their own collections and from the fieldtrips and collections tours during the workshops. Similarly, the database has not literally been designed, but there was agreement at both workshops that it should be a simple spreadsheet as some partners do not have access to Microsoft Access relational database, for e.g. Resolving these matters is a priority for early in Year 2.

Finally, it was not possible to transfer all funds identified for equipment purchase in Year 1 before the end of the financial year, but permission was granted to carry funds forward (see **4. Other Comments on Progress** below). Nonetheless, seed storage work has started on 56 species (see **comments below**), as a result of partners committing early in Year 1 to making pollinations.

### 3.2 Progress towards Project Outputs

#### Standard Measures

##### 1. Project Standard Output Measures

Code No.	Description	Year 1	Y 2	Y 3	Y4	Total to date	Total planned from application
Established codes (and Y1 targets only)							
4B & 8 Training delivery	Chengdu, China = 16 'technicians' trained for 5 days AND Quito, Ecuador = 20 'technicians' trained for 5 days UNAM Botanical Garden, Mexico. 3 day visit. 12 undergraduates trained for half a day in orchid seed sowing techniques. Colombia = one person, time unclear Costa Rica = one student, time unclear Bolivia = five students / technicians, time unclear Thailand = 14 people, assume 1 d Vietnam = various students etc, time unclear	35 x 5d = 175 pd + 6 pd + ? ? ? 14 pd				62 staff / students and 195 p.d.	32 technicians trained for 5 days, i.e. 160 person days (p.d.). (exceeded by 22 - 94%)
8	2 weeks in country (1 in China and 1 in Ecuador), plus 3 d in Mexico (Seaton), 1 d in Thailand (Pritchard) and 1 day in China (Pritchard)	3 weeks					2 weeks (exceeded by 50%)
7 (scheduled for Y2)	Book on 'Copies of Growing Orchids from Seed' given to each participating institution. Now translated into Spanish and Chinese, but not published yet. Protocols (guidelines) developed during workshops	1 1					1 (partially achieved early)

	and sent to all 35 participants from 23 institutions.						1 (achieved)
14B	Papers delivered by P. Seaton and H.W. Pritchard in Nov. 2007 about the project at: Darwin tercentenary meeting of Linnean Society Meeting; and by P. Seaton at 2 <sup>nd</sup> Scientific Orchid Conference held at UTPL, Loja, Ecuador; University of Cuenca, Ecuador. Promotion of OSSSU at FORRU (DI) workshop in Thailand (Mar 08) and at Kunming Institute of Botany lecture to students (Mar 08)	5					0 (exceeded)
15 A, B Press Releases	China: <i>Sichuan Economics Daily</i> , Oct. 2007.* Ecuador, Quito: Para salvar a las orquídeas se creará un banco de semillas. <i>La Hora</i> , Nov. 2007.* Ecuador, Quito: La meta es crear una Red Latinoamericana de Bancos de Semillas: Taller apunta a conservar las orquídeas. <i>El Comercio</i> , Nov. 2007.* Ecuador, Cuenca: Inauguran "Banco de Semilla de Orquídeas". <i>El Mercurio</i> , Nov. 2007.* Ecuador, Cuenca: Encuentros científicos. <i>El Tiempo</i> , Nov. 2007.* Ecuador, Loja: Gente, <i>La Hora</i> , Nov. 2007.*	6					16 local press releases 16 national press releases
15 C, Press Releases	Kew Scientist (2007) 32, p 8 SAMARA 14 (2008) in press Orchid Review (2007) July / Aug, p 184 Orchid Review (2008) Revista el Observador (Dec 2007)	5					1 international press release; 2 'notices' in international journals (exceeded by 66%)
18A	Quito workshop covered by two TV channels in Ecuador	2					0 (exceeded)
19 Local Radio interviews	Kanchit Thammasiri (Thailand) has participated in a radio interview about the orchid training.	1					1 interview with Hereford & Worcester local radio (achieved, but overseas)
20	Laboratory equipment (refrigerators)	0					16 (see comment under 4. Below about budget transfers)
New -Project specific measures							

Table 2 provides full details of all publications and material produced over the last year that can be publicly accessed, e.g title, name of publisher, contact details, cost. All publications and other material included with this report is marked \*

## 2. Publications

Type *	Detail (title, author, year)	Publishers (name, city)	Available from (eg contact address, website)	Cost £
The Orchid Review * JOURNAL	Orchid News: Global seed storage project by Philip Seaton, July/August 2007.	Royal Horticultural Society, London	<a href="http://www.rhs.org.uk/publications/pubs_journals_orchid.asp">http://www.rhs.org.uk/publications/pubs_journals_orchid.asp</a>	Annual subscription £29
Kew Scientist 33 * NEWSLETTER	New Grants: Orchid Seed Stores by Hugh W. Pritchard, Oct. 2007.	Royal Botanic Gardens, Kew. London	<a href="http://www.kew.org/">http://www.kew.org/</a>	available free online
The Orchid Review* JOURNAL	Orchid News: Orchid seed storage network launch by Philip Seaton, March/April 2008.	Royal Horticultural Society, London	<a href="http://www.rhs.org.uk/publications/pubs_journals_orchid.asp">http://www.rhs.org.uk/publications/pubs_journals_orchid.asp</a>	Annual subscription £29
Samara 14* NEWSLETTER	Orchid Seed: from Lindley to Modern Biotechnology, by Philip T. Seaton and Hugh W. Pritchard. In press.	Royal Botanic Gardens, Kew. London	<a href="http://www.kew.org/">http://www.kew.org/</a>	available free online
Revista el Observador * NEWSLETTER	Banco germoplásmico de orquídeas. Dec. 2007.	PROCORP Cuenca, Ecuador	<a href="http://www.revistaelobservadorec.com">www.revistaelobservadorec.com</a>	£1

\* all in the ANNEX to the Year 1 Report

### Progress towards the project purpose and outcomes

The project purpose is "To create an orchid seed bank network across 16 countries to:

- (1) conserve, as seed, 250 species from diverse habitats of varying levels of endangerment; and
- (2) develop protocols for the production of in vitro plants in support of the sustainable use of threatened species".

We are confident of signing up 16 countries into the network. To date, MoU's have been signed by 8 countries (half the participating countries) and our partners have informed us that the others will be signed. In total we have 23 institutes interested in joining the partnership, many of the extra institutes were attracted to the training workshops in China (Oct 07) and Ecuador (Nov 07). We decided to share out the funding across a wider group of partners than originally anticipated to increase the likelihood of exceeding the target of conserving 250 species. Because the signing of the MoUs was not complete before the end of March 2008, we requested a carry forward of funds - see **4. Other Comments on Progress** below.

We have however purchased 5,040 Universal bottles and 10,000 'Wheaten' vials for seed storage; each will include pillow pack of silica orange indicator of which we have bought 8,000. These items are being prepared for mailing to each project partner.

Although the project did not formally start until 1 Oct 2008 (including the appointment of Phil Seaton as Project Manager), we agreed with collaborators to include in the targeting for conservation any species that had been pollinated within this report year (i.e. 1 April 2007 to 31 March 2008). In knowledge of the successful bid for funding and reflecting the enthusiasm of collaborators to get started they have reported the pollination and seed collection by Costa Rica (3 species), Bolivia (3 sp), Thailand (29 sp), Indonesia (3 sp), Ecuador, Loja (3 named sp.), Singapore (5 sp), Chile, Vina del Mar (7 sp), Vietnam (3 sp) = **56 species**. This excludes 50 sp. at China, Beijing, as we have not been provided with the species' names.

62 people trained (i.e. 30 additional), ranging from Technician to PhD grade.

Site / laboratory visits have been made to collaborators in Mexico (Seaton, Mar 08), Thailand and China, Kunming (Pritchard, Mar 08). Mexico (the 16<sup>th</sup> country) have agreed to sign a MoU.

### **Progress towards impact on biodiversity, sustainable use or equitable sharing of biodiversity benefits**

The collecting of seeds from > 50 orchid species is already a valuable contribution towards the conservation of biodiversity in general, and supports individual country programmes for conservation. For some species collected, in vitro propagation protocols have been resolved, which contributes to the sustainable use of seed material. The project has also contributed to other objectives of the CBD including international co-operation in conservation research and through building human capacity for orchid conservation. We have not yet engendered co-operation between government bodies and the private sector (growers), but are planning to develop our rationale and approach to this interaction in Year 2 by organising an orchid conservation workshop in the UK for the managers of the national orchid collections and some private growers. This may require modest input of DI Project funds, for e.g. to book a meetings room. If we can develop an appropriate 'working' relationship in the UK, then we will seek to use that knowledge to engender similar arrangements in other countries.

## **2. Monitoring, evaluation and lessons: (A) Workshops evaluation and (B) Advisory Team meeting**

### **(A) Evaluation summary of workshops:**

#### **CHENGDU WORKSHOP (Oct 07)**

	<b>Very good</b>	<b>Good</b>	<b>Average</b>
Travel arrangements	10	4	0
Hotel accommodation	4	8	2
Food	11	3	0
Information exchange (presentations and discussions)	8	5	1
Theory/practical: pollination	8	6	0
Theory/practical: seed harvesting and processing	11	3	0
Theory/practical: sowing and germination	10	4	0
Theory/practical: storage	9	5	0
Conservation discussions	5	9	0
Project planning, management/leadership style	9	3	2

\* No participants considered anything either to be 'poor' or 'below average'.

### **Comments**

#### **Travel**

Very good. Everything went perfectly.

Everything was in order from leaving our own country to arrival in Chengdu.

#### **Hotel**

The odour of a chemical being used in the opposite room which was being renovated permeated into our room. The smell disappeared in the evening when work stopped.

There were a lot of distractions due to the renovation work in the hotel, including the smell of varnish/paint.

#### **Food**

Good spread. / The choices of food and venues were excellent. /Thanks a lot to Wenqing!

We were able to experience a lot of different cuisines.

#### **Information exchange**

The information exchange among participants is really useful for us. / Should allow more time for every country participant to present their work and facilities, interests and involvement./

A compilation or summary or abstract of each country's work/presentation may be useful to each participant to determine the strength/weakness of each country. /

There was always room for discussion and information exchange, which was very good.

### **Pollination**

It would be good to provide some various types of flowers and practise pollinating them./

It would be a good idea to have actual flowers in the presentation, and allow each participant to carry out actual pollination. /On hand training can also be important. Tim's presentation was most informative./ Very good presentations, though lacking in practical. / Need to refer to more literature for practical application.

### **Seed harvesting and processing**

Hands on harvesting actual seed capsules. Live demonstration would be helpful.

It would be a good idea to have samples of capsules and demonstrate processing of seed.

Good discussions and presentations on this.

### **Sowing and germination**

Good to provide a set of syringes each and practise the method of sterilisation. Same for the small packet method.

No need to do it in a laminar flow hood./

A guideline is needed. / Good discussion. However, I hope that we are able to see and have of feel of counting germination.

### **Storage**

Provide live demonstration. Actual tubes to store seed, desiccator etc. / More details are needed for further work.

### **Conservation discussions**

Should allow more time for discussion in this subject. / More time for discussion would be helpful.

### **Planning, management and leadership**

A great way to build consensus together. / Very satisfactory.

### **How would you improve the delivery of the workshop?**

More live demonstration is important./

As a teacher in Hainan University I will carry out the following steps to deliver this workshop: (i) seminars on orchid seed storage and sustainable use (ii) purpose of programme of orchid seed storage (iii) workshop for undergraduate and graduates (iv) give information to people working in nature reserves etc./

It would have been better to provide all the workshop materials on the first day./

Passing the information by propagating the workshop message. The main ideas will be included in our own garden's education programme./

Audio-visual aids should be well-prepared. Documents for the workshops, such as lectures and presentations by participants should be available at the workshops./

I got a lot of new information that we can apply to workshops in our own country. I will pass on this information to researchers and students./

I gained a lot of useful information that I will pass on to my colleagues./

At the start of the workshop it would be useful for each participant to have a directory of all the abstracts of each country's work, and each presentation to be given a certificate of presentation (needed by participants like ourselves for our university)./

All presentations made in the first four days, leaving the final day for discussion /evaluation/comment. /

Visit to at least one botanical garden./

All country reports should be presented on the first day, so that on the first day each participant knows what each other is doing./

More room for information exchange/discussion during the main hours./

I am satisfied with the outcome of the project workshop. However, an additional one or two days would be appreciated to ease the tight schedule./

### **Other comments**

It was a wonderful workshop, especially in organisation and lectures./

Please tell people to prepare a presentation before they come to the workshop./  
 How to divide seed into various batches for experiment and storage? Many participants asked the question. Thank you for organising the workshop. It is great!/  
 Orchid seed germination includes two aspects: asymbiotic and symbiotic germination. The relevant knowledge of symbiotic germination may be very important./  
 It would have been somewhat better if the workshop had been held about one month earlier./  
 Thank you for giving us the chance to come to Chengdu and to join the OSSSU Project/Workshop. We got a lot of information/knowledge in seed conservation of orchids, which is very useful for us in conserving orchids./  
 A friendly warm and informative workshop./  
 I was well-organised to enable all participants to get to know one-another./  
 The chemistry of Phil, Hugh and Holger was really great, and with the coordination and assistance of Wenqing, the orchid conservation workshop was excellent./  
 It is a very well-run workshop. Congratulations. It is a difficult job to bring all of the countries together. It is tough work, but you made it possible./  
 A very informative, exhaustive deliberation. It was a great opportunity for me to learn the latest techniques being employed by different countries for orchid seed management for sustainable utilisation./  
 Excellent basis to start a network by personally meeting and working together for five days.  
 We congratulate the organisers (Phil, Hugh, Holger and wenqing) for putting up a superb workshop with long-lasting effect to the orchid world and humanity.

**EVALUATION SHEETS SUMMARY**  
**QUITO WORKSHOP (Nov 07)**

	Very good	Good	Average
Travel arrangements	15	0	0
Hotel accommodation	10	5	0
Food	12	3	0
Information exchange (presentations and discussions)	10	4	1
Theory/practical: pollination	8	7	0
Theory/practical: seed harvesting and processing	8	7	0
Theory/practical: sowing and germination	9	4	2
Theory/practical: storage	10	5	0
Conservation discussions	9	6	0
Project planning, management/leadership style	15	0	0

\* No participants considered anything to be either 'poor' or 'below average'.

**Comments**

**Travel**

Very good and fast. / Everything was on time and with quality. / Very good. / Everything was OK.

**Hotel**

Very good / Excellent / Everything was OK.

**Food**

Nothing could be changed / Excellent. / Everything was OK.

**Information exchange**

Maybe a translator / Mybe a translation service could be of benefit. / Very important/excellent  
 Clear and interesting. / Probably it would be a good idea to have written accounts for each presentation for non-English-speaking participants. / We need an outline in order not to repeat information.



### **Pollination**

Lack of practice in the greenhouses./ Excellent teachers. / I understand this topic. It was easy to share experiences. /Very good. / I expected more scientific information.

### **Seed harvesting and processing**

Excellent teachers / Not enough practical. /Show in the laboratory./ Have more practice. I expected a little more information.

### **Sowing and germination**

Excellent /I have experience. / Exchange experiences.

### **Storage**

Excellent. / We must learn more about it in the near future, doing and reading. /Show in the laboratory.

### **Conservation discussions**

Excellent and very important. / People preferred to speak in Spanish to be able to understand everything. / Importance of the results of each group.

### **Planning, management and leadership**

Good. / It was good as the first step in training to show us the goals and wishes to begin working on our project.

### **How would you improve the delivery of the workshop?**

To include practical session. / Practice in greenhouse in pollination and other aspects.

I would have liked practice in pollination and conservation. / I am disposed to share my experiences and knowledge with other people and if you wish, I will act as a trainer or professor for new members in the network. / Participants preparation in English.

More information on paper. / Having information of the activities prior to coming to Quito. The workshop was good. Things that didn't work were out of your hands. / I think the workshop could have been shorter, but on the other hand to spend a week together made strong personal links.

### **Other comments**

A book,or other kind of publication could be produced to put all the information together./

In my opinion the workshop has been very well organised. / The organisation was excellent. The organisers and people from Quito made us feel at home. / Implement and include laboratory practice. / Thank you for permitting me to be a member of this project. / Demonstrate methods of working to improve techniques. / Thank you for giving me the chance to be part of the OSSSU Project, and for your kindness. / Thank you so much for this opportunity and for your support for orchid conservation. / It was an excellent opportunity to exchange experiences and know other people involved with orchids.

### **(B) OSSSU Advisory Team**

The OSSSU Advisory Team was established in the autumn of 2007 and the first meeting was held on 16 Jan 2008.

**Minutes**  
**OSSSU Advisory Team Meeting**  
**Wellcome Trust Millennium Building, Wakehurst Place,**  
**11:00, Wednesday 16<sup>th</sup> January 2008**

**Present:** Grace Predergast & Margaret Ramsay (Kew) Prof Hugh Pritchard (Chair), Steve Alton, Dr Tim Marks (minutes) & Phil Seaton (Wakehurst Place); and Prof Mike Hutchings (Univ Sussex, external advisor).  
Invited but absent: Dr Stuart Cable (Kew)

## AGENDA

### 1) Review of main components of the OSSSU project

HWP gave a background to the project and described the logframe for objectives, activities and outputs. The duration of the project covers four financial years, and follows the common Defra format for Darwin Initiative projects, where the potential for non-delivery of objectives by participants has been identified.

The project has two regional hubs; one in Quito (Ecuador) for South America, and the other in Chengdu (China) for Asia. A database for all groups will be constructed in Excel for ease of access by all partners.

Some 250 species have been identified for collection and storage. Knudson C medium will be used as a standard medium for germination trials, while partners will use another of their choice.

GP mentioned that protocols had been developed at Kew (Microprop.) for species identified on the list (such as suitable media), these could be utilised or distributed if needed. PS said that two media would probably be all that partners would be able to deal with, and that a common protocol was being distributed, and the 'Orchids from Seeds' book was being translated into both Chinese and Spanish. HWP said that partners were at different levels of resources or need for support, but all had basic germination and tissue culture skills. Basically they lack storage knowledge. Hope that all will use Knudson C medium, plus one more medium for germination.

In regards orchid seedbanks, will want to go beyond 16 partners with time; such as Mexico (UNAM) and build upon MSB contacts; or with Argentina (MR).

MR asked about seed distribution between partners and to the MSB, and future withdrawals? What are they going to be used for? HWP said intention is to duplicate in-country, and offer of storage at MSB. Emphasised at workshops that >10,000 seeds per collection should be made. PS noted that plant and seed movement considered to be OK by Asian partners (Chengdu workshop), may be issues with Ecuador. Issues raised regards CITES status of plants and location of orchid seedbank by their ministry at the Quito workshop. Facilities at Loja are better, and the ministry are keen to seed a seedbank there.

### 2) Progress to date, including the workshops

PS Two workshops of five days; Chengdu (Oct 2007) and Quito (Nov 2007). Good attendance at both, plus respective ministry and media representatives.

Day 1. Partners described their lab facilities and current state of any collections.

Day 2. Partners described expected outputs. Collection targets are modest, ~ 20 species per institute. Native species are to be targeted (listed), but these may change depending upon availability of plants and seeds. Partners are now committed to outputs described in the logframe. (HWP Targets were modest but realistic for the Asian group, whereas the South American group wanted to expand species numbers)

Day 3. Discussed techniques to be used; such as pollination where appropriate, medium for germination and storage processing and conditions.

Day 4. In-depth discussion led by HWP on storage, where partners described their current approaches. Many offered talks on institutes and techniques, and were very keen to show what they could do.

Day 5. Discussed 'Technical backstopping'; support from Kew orchid seed specialists. Also publicity, budget, project management, contents of draft MoUs (prepared by Catherine Daniels, Kew. Spanish version to be produced by legal translator) and the possibility of a final meeting to be held somewhere in Africa.

Collected protocols that partners are using. Some 30 species are already in store; mainly in China, but some in Loja. Information from Holger Perner (China) translated and sent to Chile. Information from all partners to be stored in central database which could be distributed by CD.

Very good feedback on Workshops on evaluation forms (**see below**).

MH asked if articles we wanted to distribute were covered by copyright, need to ensure permission sought from publishers. HWP replied that IP on images may be a concern.

HWP said workshops did not prove as expensive as envisaged and need to identify where we can invest the surplus:

- 1) Extra workshop, but with only one participant per country (probably too costly),
  - 2) Further equipment to needy partners (e.g. Cuba, India, Columbia) (requires consideration),
  - 3) Provide some consumables across a larger number of institutes (general approval).
  - 4) Bring in an extra country/institute such as Mexico/UNAM to reach 16 countries (general approval).
- Need to ensure that institutes involved have long-term viability to preserve seeds for the future.

### 3) Promoting OSSSU externally, including Millennium Seed Bank Project partners

HWP suggested that the profile of orchid seeds could helpfully be raised within the MSBP and Kew. SA suggested that the Samara magazine would be a good medium for this provided with an appropriate story.

HWP queried if there were opportunities to bring in commercial organisations. What would they be able to contribute? PS felt that companies said they were interested in conservation, but essentially they would be interested in obtaining seeds. With the appropriate IP protection, could OSSSU partners provide seed? What is their current position on commercialisation? PS noted that some of the listed orchids are in NCCPG collections, these might be more appropriate for conservation. SA should try to get more of the MSB International co-ordinators on-board. They will be looking for 'opportunities' post-2009. Can also help with any approaches to NCCPG.

### 4) Fundraising suggestion and complementary projects

HWP explained that a project on Vanilla seed storage (temperatures and germination medium) and seed characterisation (thermal profiling) is being considered. SG is already involved with orchids in Madagascar, and we need to establish the relationship between OSSSU and any existing effort on orchid seed conservation. SA suggested that the Kew Foundation should be asked to look into raising the profile of orchids/seed. GP said that Dave Roberts was already involved in a project in Laos to raise plants from seeds, possibly funded by the Leverhulme foundation. PS said that the next World Orchid Conference is in Singapore in 2011, and MR that the European Orchid Conference (not sure of date) follows a different cycle, but might be meeting during the lifetime of the project. RHS could also be another organisation to publicise OSSSU.

### 5) AOB

HWP feels that Kew can provide a range of back-up to the project. The species list may change and it would be useful to provide information on seed germination from the Microprop. database as appropriate. New information generated would be placed on an Excel database for universal accession. GP asked if we could draw in other databases from around the world ; HWP said this would need extra funding. MR added that information held by Kings Park, in the USA and by ENSCONET on storage could be useful. Felt we shouldn't be restricted by what partner countries were doing. SA said that Associate/Affiliate partners could be upgraded as future funding came on-stream. This approach had been adopted by ENSCONET.

HWP/MR GSPC targets are being hit in this project.

(NB. Since the meeting, the protocol for identifying and processing species seed, which was drafted at the workshops, had been consolidated and distributed by PS) .

Next meeting Tuesday 15<sup>th</sup> July 2008

## **3. Actions taken in response to previous reviews (if applicable)**

Not applicable

#### **4. Other comments on progress not covered elsewhere**

We wrote the following to Lisa Spencer on March 14<sup>th</sup> 2008:

"I am writing to request a carry forward of £32,000 to the next financial year 08-09 to transfer of funds to OSSSU partner countries. The start date for the project was 1st October 2007, and in October and November we successfully delivered two orchid seed storage workshops, one in Chengdu, China and the other in Quito, Ecuador. We are working with 23 different institutions in 16 partner countries, and are encountering difficulties transferring funds to some of our partners within the required deadline. We are currently in the process of signing MoUs with all the different countries. This has been very time consuming, but we are confident it will be completed soon. Unfortunately we are encountering difficulties in completing the required paperwork for agreements on time to transfer the money before the end of March, 2008. The countries with which we are encountering difficulties are China (with 4 institutions), India (potentially two institutions), and Cuba. We have only recently resolved the problem of finding a suitable partner in Mexico, and wish to transfer similar funding to our partner in that country. Our concern is that if we are unable to transfer these funds, which have been specifically earmarked for the purchase of small amounts of equipment, these partners will not be able to fulfil their obligations regarding the project, which jeopardises its success. This money is essential for these institutions to buy equipment and consumables that will be used throughout the project. If we fail to buy the equipment and consumables, the partners will not be able to deliver, and the project will not be successful"

We received the following reply on March 20<sup>th</sup> 2008. " I am pleased to confirm that your request to carry forward funds into 08/09 has been approved".

#### **5. Sustainability**

We aimed to train at least 2 staff / students from each partner country, which we nearly achieved across the board. Our requests at the workshops for cascade training, using learning materials distributed at the workshops (and the 'growing orchids from seeds' book), appear to have been heeded. Whilst we do not have all the facts and figures yet, the materials have been used to 'train' about 30 extra people. So, we remain confident that a cadre of orchid conservation specialists across the world can be further developed, adding to sustainability in each country and across each region.

We have not fully engaged yet with the IUCN Orchid Specialist Group, although numerous of the partners are members. However, when the web site is in operation we will seek to link to the OSG site.

We emphasised at the workshops that the objective of the seed storage programme was to conserve seed for time periods beyond this phase of the OSSSU project. Partners agreed to harvest > 10,000 seeds whenever possible and to check seed quality at 6 months, 1 and 2 years; and then post-OSSU, at 4 and 8 years, etc. This commitment is very encouraging.

Also at the workshops, we had very constructive discussions on alternative funding options for expansion of existing work or extension post-OSSSU, either within country or at the network level. Some partners are already actively engaged in seeking other funds.

#### **6. Dissemination**

We published five articles promoting OSSSU and gave five talks at conferences or at research institutes (see listings above and the Annex)

## 7. Project Expenditure

### Project expenditure during the reporting period (Defra Financial Year 01 April to 31 March)

With thanks to George Sarkis and colleagues. Please also note the request to carry money forward in 4. **Other Comments on Progress** above.

#### .COSTS FOR CLAIM PERIOD

1. **Staff** Please provide the **actual** total expenditure on employment of staff for the period covered by this claim, where funded under this year's Darwin Initiative grant.

Staff employed (Provide name and position)	Proportion of time to be spent on this work	Date work will commence and finish	Cost (£)
Philip Seaton			
Tim Marks			
Margaret Ramsay			
Steve Alton H.Pritchard			

#### 2. Total costs

Please provide **actual** total costs for the year, where funded under this year's Darwin Initiative grant. All columns must be completed.

Annex 1 Current Year's Costs	2007/8 Grant	Claimed so far (2007/8)	Claim for this period	Remainder for 2007/8
Staff costs				
Rent, rates, heating, lighting, cleaning				
Postage, telephone, stationery				
Travel and subsistence				
Printing				
Conferences, seminars etc				
Capital items				
Others (please specify)				
3. <b>TOTAL</b>				

*A - This should not exceed the total annual grant approved in the Offer Letter*

*B - Insert this total in Section 2 of main form (Certification)*

\* Additional time inputs by Pritchard for visits to Thailand and China

#initially intended to send hardcopy of some materials for the workshops, including the book on 'growing orchids from seeds' but these were taken as luggage.

† not all costs for the two workshops overseas were in before end March 08.

⌘ equipment and other costs in country delayed due to resolution of MoU (see 4. **Other Comments on Progress** above).

#### 3. Income from other sources

***Please state other sources of income received in the current year towards project costs***

Source of Income	Amount
nil	nil

Highlight any agreed changes to the budget and explain any variation in expenditure where this is +/- 10% of the budget.

**8. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes**

[I agree for ECTF and the Darwin Secretariat to publish the content of this section](#) (please leave this line in to indicate your agreement to use any material you provide here)

## 1. Report of progress and achievements against Logical Framework for Financial Year: 2007/08

Project summary	Measurable Indicators	Progress and Achievements April 2007 - March 2008	Actions required/planned for next period
<p><b>Goal:</b> <i>To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but constrained in resources to achieve</i></p> <p><i>The conservation of biological diversity,</i></p> <p><i>The sustainable use of its components, and</i></p> <p><i>The fair and equitable sharing of the benefits arising out of the utilisation of genetic resources</i></p>			<i>(do not fill not applicable)</i>
<b>Purpose</b>	To create an orchid seed bank network across 16 countries to: (1) conserve, as seed, 250 species from diverse habitats of varying levels of endangerment; and (2) develop protocols for the production of in vitro plants in support of the sustainable use of threatened species.	In Year 1 sixteen countries committed to project, as planned. Eight signed agreements in Y1; the rest are promised.	Some concern about India signing , so Pritchard or Seaton will visit early in 2008-09 (Y2)..
<b>Output 1.</b>	Improved 'in-country' facilities for seed storage and in vitro germination;	In Y1 storage vials and silica gel packets were purchased and will be dispatched early in Y2. As MoUs are signed off, the carried forward equipment budget will be used to purchase freezers in country.	
<b>Output 2.</b>	Trained staff in orchid conservation biotechnology	In Y1 the target of 32 trained staff exceeded during the workshops and cascade training extend to about the same number of people using learning materials from the workshop.	
<b>Output 3.</b>	Data and germination protocols, and storage information;	The laboratory work was initiated in the first six months as planned and germination protocol development started for a few species in Y1. In Y2 the Management team need to	

		consolidate a table of germination conditions and media suitable for the named species, or related species; and to encourage summarising of germination data as it is generated.
<b>Output 4</b>	Training materials in Spanish, Chinese and English	In Y1 all collaborating institutes received a copy of the technical manual 'Growing orchids from seeds', and this volume has been translated into Chinese and Spanish. Important in Y2 to have copies published in these two languages.
<b>Output 5</b>	Distributed, searchable electronic database	Not achieved in Y1 and need to finalise design of 'shared' spreadsheet early in Y2 to ensure that germination protocol data (and other information) per species is recorded and shared. The web site delivery is a matter of urgency for Y2.
<b>Output 6</b>	Advisory replies to enquiries	Phil Seaton has been fielding a considerable number of email requests for information in Y1. This will continue in Y2.
<b>Output 7</b>	<b>Conservation collections of seeds / in vitro plants created / strengthened</b>	Year 1 target of 40 species' seed to be collected, processed and banked was exceeded by 16 species. Also, collaborators at the workshops indicated by how many species they felt would be added to their collections from seedlings grown from seeds in vitro over the course of the OSSSU project – please see Conference Report from Quito, Ecuador in Annex. In Y2 the seed handling expectation is higher (90 sp) and the Management Team will request early in the year an updating of target species lists from collaborators.
<b>Output 8</b>	Public talks (in-country) on integrated conservation strategies and procedures	The Management Team gave numerous public talks in Y1, and some collaborators also gave public talks although exactly when was sometimes not clear. We will encourage more talks in Y2 and endeavour to get more accurate facts and figures against this output from each country partner.



## 2. Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve: (1) the conservation of biological diversity (2) the sustainable use of its components, and (3) the fair and equitable sharing of benefits arising out of the utilisation of genetic resources</b></p>			
<p><b>Purpose</b></p> <p>To create an orchid seed bank network across 16 countries to: (1) conserve, as seed, 250 species from diverse habitats of varying levels of endangerment; and (2) develop protocols for the production of in vitro plants in support of the sustainable use of threatened species.</p>	<p>Number of countries actively contributing to the science and sharing information</p> <p>Number of countries wishing to join network (EoI)</p>	<p>DI annual reports, Bulletin Board traffic, etc.</p> <p>Correspondence</p>	<p>No breakdown in communication and trust between UK lead and the collaborating institutes leading to cancellation of MoUs.</p> <p>No institutional realignment</p>
<p><b>Outputs</b></p> <p><b>Improved 'in-country' facilities for seed storage and in vitro germination;</b></p> <p>Trained staff in orchid conservation biotechnology</p> <p><b>Data and germination protocols, and storage information;</b></p> <p>Training materials in Spanish, Chinese and English</p> <p><b>Distributed, searchable electronic database</b></p> <p>Advisory replies to enquiries</p> <p><b>Conservation collections of seeds / in vitro plants created / strengthened</b></p> <p>Public talks (in-country) on integrated conservation strategies and procedures</p>	<p><b>16 countries</b></p> <p>&gt; 32 trainees (plus cascade to many more)</p> <p><b>250 species</b></p> <p>1 set of guidelines on orchid seed conservation</p> <p><b>1 created</b></p> <p>Response to enquiries within 30 days of receipt</p> <p><b>1 multispecies collection per institute</b></p> <p>At least 1 per year per institute</p>	<p><b>Institutional annual reports</b></p> <p>Attendance lists and workshops reports</p> <p><b>Publications and web uploads</b></p> <p>Refer to OSG site</p> <p><b>Accessible in all 16 countries</b></p> <p>Correspondence</p> <p><b>Collections databases held locally</b></p> <p>Posters / web site notices and head count record</p>	<p><b>Impact of altered institutional budgets tolerable</b></p> <p>Loss of trained staff from institutes minimal</p> <p><b>Species germination is not intractable</b></p> <p>Cost of any translation needs not increase prohibitively</p> <p><b>Interoperability between countries / software</b></p> <p>Filing is efficiently performed</p> <p><b>Created collections maintained adequately / continuity of care</b></p> <p>Publicity reaches the target audience</p>

Activities	Activity Milestones	Assumptions
<p>Equipment purchase</p> <p><b>Information consolidation and distribution</b></p> <p>Species seed collected and conserved, database created</p> <p><b>Produce in vitro plants via germination.</b></p> <p>Organise and run two training courses, write and distribute training materials;</p> <p><b>Education programme established</b></p>	<p><b>Y1:</b> Sign MoUs (12/07); two training workshops (10-11/07); purchase equipment (10/07 – 3/08); initiate lab work (11/07); collect, clean, store and sow c. 40 orchid species (all year); establish and operate clearing house(CH) , and web site (3/08); design data base (3/08); public lectures (all year). <b>Y2</b> (all year): Collect, clean, store and sow c. 90 orchid species; update database &amp; operate CH; publications and lectures. <b>Y3:</b> Collect, clean, store and sow c. 90 orchid species; update database &amp; operate CH; publications and lectures (all year); <b>Y4:</b> (all year): Collect, clean, store and sow c. 20 orchid species; update database &amp; operate CH; publications and lectures; hold final workshop; issue final guidelines</p>	<p><b>Export of major items from UK avoided;</b></p> <p>Kew access to databasing and other e-literature maintained and systems compatibility globally;</p> <p><b>Easy access to (targeted) species / plants / seeds continues;</b></p> <p>Power supply remains regular and infrastructure intact;</p> <p><b>Sufficient staff of appropriate calibre identified and available for the courses.</b></p> <p>Fits institutional priorities / timelines</p>

### 3. onwards – supplementary material (optional)

#### *Checklist for submission*

	Check
<b>Is the report less than 5MB?</b> If so, please email to <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> putting the project number in the Subject line.	✓
<b>Is your report more than 5MB?</b> If so, please advise <a href="mailto:Darwin-Projects@ectf-ed.org.uk">Darwin-Projects@ectf-ed.org.uk</a> that the report will be send by post on CD, putting the project number in the Subject line.	
<b>Do you have hard copies of material you want to submit with the report?</b> If so, please make this clear in the covering email and ensure all material is marked with the project number.	✓
Have you completed the Project Expenditure table?	✓
Do not include claim forms or communications for Defra with this report.	