

DARWIN INITIATIVE FOR THE SURVIVAL OF SPECIES: APPLICATION FOR GRANT FOR ROUND 10 COMPETITION

Please read the accompanying Guidance Note before completing this form. Give a full answer to each section; applications will be considered on the basis of information submitted on this form. Applicants are asked not to use the form supplied to cross-refer to information in separate documents except where this is invited on the form. The space provided indicates the level of detail required but you may provide additional information on a separate sheet if necessary. Copies of this form are available on disk or by e-mail on request. You are asked also to complete the summary sheet. Although you may reproduce this sheet in a reasonable font, you should not expand it beyond an A4 sheet (leaving the allocated space for DEFRA comments to be made) as additional information will not be taken into account.

1. Name and address of organisation

HORTICULTURE RESEARCH INTERNATIONAL

2. Principals in project

Details	Project leader	Other UK personnel (if working more than 50% of their time on project)	Main project partner or co-ordinator in host country
Surname	Blakesley		Elliott
Forename(s)	David		Stephen
Post held	Research Leader		Lecturer
Institution (if different to above)			Chiang Mai University
Department	Plant Breeding and Biotechnology		Biology
Telephone			
Fax			
Email			

Please provide a one page CV for each of these named individuals.

3. Project title (not exceeding 10 words)

Education and Training for Restoring Tropical Forest Biodiversity

4. Abstract of study (in no more than 750 characters)

Since 1994, Chiang Mai University's Forest Restoration Research Unit (FORRU) has developed ways to recover biodiversity on degraded forestland in N. Thailand. This project will establish a Darwin Forest Restoration Extension Team to disseminate FORRU's results to those involved in natural forest restoration to restore biodiversity. The team will implement bi-monthly workshops, a school's program and technical input into various forest restoration projects underway in the region. Community tree nurseries, demonstration field plots and a Forest Restoration Manual will continue to provide advice to tree planters long after the project has ended. Newsletters and a network will facilitate information exchange. The project will target personnel responsible for training others, to build lasting capacity to improve forest restoration programs.

5. Timing. Give the proposed starting date and duration of the project.

01 April 2002 for 3 years

6. Describe briefly the aims, activities and achievements of your organisation. (Please note that this should describe your unit, institute or department within a university.)

Aims

The Plant Breeding and Biotechnology Department aims to develop a world class research programme in the conservation and genetic improvement of perennial fruit and forest trees, and crop genetic resources. It has a broad research base, encompassing temperate and tropical tree species, with particular expertise in the development of conservation strategies, forest restoration, and genetic investigations on key traits such as flowering, fruit quality and plant architecture. The strategy is an integrated approach, which also involves conventional breeding and genome analysis, and recognises our need to train visiting workers.

Activities

With respect to forest trees, current research includes an EU programme using European Chestnut *Castanea sativa* as a model for combining gene conservation and breeding of a multipurpose tree species. This reflects its wide distribution and multipurpose use, from native forest to fruit orchard. The study of gene flow and adaptive traits will allow the formulation of gene conservation programmes to ensure adequate genetic resources for the future evolution and exploitation of populations. We are also working with Chiang Mai University, Thailand on a research programme to accelerate the restoration of natural forest ecosystems, focusing on the identification, selection and production of 'framework species', which, when planted in degraded areas catalyse forest regeneration. In the UK, we have an active programme funded by DEFRA since 1988 on the collection, characterisation, breeding and mapping of wild cherry, and are initiating such work on ash, oak and walnut with EU and charitable funding. The collections of 'plus' trees and related species form the basis of our breeding programmes. We also have considerable experience in technology transfer, including information presentation, promotion and training of visiting workers.

Achievements

Dr D Blakesley has worked with the Forest Restoration Research Unit (FORRU) in Thailand for 8 years, on the development of the 'framework species method' for seasonally dry tropical forests. During this time, approximately 400 tree species have been propagated, resulting in the selection of 36 framework species for field trials. With Dr C James, he has trained a Thai PhD student to use molecular markers to identify genetic diversity within two framework species, *Prunus cerasoides* and *Castanopsis acuminatissima*. This study has already helped select seed trees of these species which will avoid narrowing the genetic base. K Russell and K Tobutt have released a set of 10 'Wildstar' wild UK cherry clones after assessing the disease resistance and silvicultural merit of 'plus' trees selected from the wild. K Tobutt has received an IPGRI funded Vavilov Frankel Fellow to study genetic diversity in semi-wild vineyard peaches, and an EU funded Marie Curie Fellow to study genetic diversity in Olive. K Russell is training a visiting worker funded by the Belgian Government in the application of molecular techniques to the study of gene flow in cherry. K. Tobutt is vice-chairman of the ECP/GRI Fruit Network Comodity Group and K Russell represents the UK on EUFORGEN and on the Chestnut Cost Action.

7. Has your organisation received funding under the Initiative before? If so, please give details.

NO

8. Which overseas institutions, if any, will be involved in the project? Please explain the responsibilities of these institutions.

Chiang Mai University's Forest Restoration Research Unit (FORRU) is located in Doi Suthep-Pui National Park, in northern Thailand. Both National Park staff and local villagers collaborate closely with the unit's activities. Since 1994, FORRU's research programme has developed methods to accelerate biodiversity recovery in forest restoration projects on degraded land, within protected areas in northern Thailand. FORRU has screened approximately 400 native tree species for their suitability for planting in degraded areas; developed appropriate nursery and silvicultural techniques for 'framework tree species' i.e. those that catalyse the recovery of biodiversity when planted in degraded areas; and developed techniques to monitor the recovery of biodiversity in planted plots. A very large amount of new knowledge has been generated about how to rapidly restore diverse forest ecosystems on degraded sites within conservation areas in the northern highlands of Thailand. This application to the Darwin Initiative will enable FORRU to implement an education and extension programme that will disseminate the results of its research programme as widely as possible to all individuals or organisations involved in forest restoration for biodiversity conservation. The responsibilities of FORRU in this project will be i) to establish a sub-unit with qualified, trained staff, office space and equipment to run an education and extension programme and ii) to collate all information from FORRU's research programme required to compile a Forest Restoration Manual and other educational materials.

PROJECT DETAILS

9. Define the purpose (main objective) of the project in line with the logical framework.

The most serious threat to biodiversity in Thailand and neighbouring countries is forest loss. To address this, our main purpose is to build lasting capacity to restore forests on degraded land for biodiversity conservation through improved forest restoration and biodiversity monitoring practices, based on sound scientific research. In the mid-1990s, a national programme to celebrate the King's Golden Jubilee advocated the use of indigenous forest tree species for permanent restoration of degraded forestland in protected areas for biodiversity conservation. Implementation was constrained by a lack of knowledge about how to select, grow and plant the large number of indigenous tree species. Furthermore, monitoring of biodiversity recovery in restored areas was non-existent. FORRU has developed model research and community tree nurseries as well as demonstration field plots. A very large amount of new knowledge has been generated, which now needs to be disseminated to key personnel and groups involved in restoring the nation's forests for the conservation of biodiversity i.e. Forest Department officials, villagers, NGOs and, most importantly, schoolchildren who have most to gain from restoration of diverse forest ecosystems. This will improve the efficiency of existing forest restoration activities, provide those interested in starting new forest restoration activities with all the knowledge and technical support they need to get started and encourage monitoring of biodiversity in restored areas.

10. Is this a new project or the continuation of an existing one?

This Darwin 'Education and Training for Restoring Tropical Forest Biodiversity' application constitutes a new project complementary to FORRU's research programme. It would not take place without Darwin funds.

11. What is the evidence for a demand or need for the work? How is the project related to conservation priorities in the host country(ies)? How would the project assist the host country with its obligations under the Biodiversity Convention?

How was the work identified?

Demand for the information generated by FORRU's research programme has become overwhelming. Existing FORRU staff are primarily researchers, carrying out nursery and field experiments to improve the performance of planted trees and increase biodiversity in restored forest ecosystems. Although a few ad hoc educational activities have been run, they by no means meet the demand for such activities and divert existing staff from their primary research duties. The small number of educational events run by the unit so far are always heavily over-booked and our present staff are unable to respond to the large number of requests to provide extension services at the many tree planting projects currently underway in northern Thailand.

How is the project related to conservation priorities in the host country?

The Thai Government has identified deforestation as the greatest threat to biodiversity. Even before the Biodiversity Convention (1992), the Thai Government recognised the need to preserve existing forest for biodiversity by establishing one of the most extensive protected areas systems in Asia. Unfortunately, many of these included large deforested areas. The Government identified an urgent need to restore forest cover from the present level of less than 20% of the Kingdom's area to 40%, with 25% earmarked for biodiversity conservation. A project to mark the King of Thailand's Golden Jubilee was implemented to plant trees on 8,000 km² of degraded forestland. The enthusiasm with which villagers, children, NGO's etc. participated in tree planting showed immense public support for large-scale forest restoration. However, the project is considerably constrained by a lack of knowledge about how to grow, plant and care for the great diversity of forest tree species native to Thailand. Over the past 7 years, FORRU's research programme has generated a lot of knowledge relevant to these issues. Therefore, the effectiveness of forest restoration projects could be considerably improved through dissemination of such knowledge.

How will the project assist the host country meet its obligations under the Biodiversity Convention?

The Thai Government is implementing projects to meet requirements of CBD ratification, eg the government-funded Biodiversity Research and Training Programme has supported numerous projects to classify, map and monitor Thailand's biodiversity. Efforts to address obligations to preserve and restore ecosystems (UNCBD, Articles 7, 8, 10) are less well advanced. FORRU has accumulated significant knowledge in 4 critical areas needed to carry out successful forest restoration (trees species selection, propagation, planting and biodiversity monitoring). Under the CBD, Thailand is obliged to involve local people in the restoration of damaged ecosystems. Therefore, there is an urgent need to produce environmental educational materials to meet local community needs for nursery facilities, propagation and habitat management plans for native trees, to disseminate it and to train individuals in the effective use of these methods (UNCBD, Articles 12, 17, & 18). The restoration of Doi Suthep-Pui National Park (DSPNP) itself is also extremely important. Inventories by CMU staff indicate that its tropical dry forests are among the most diverse in tree species in the world, but large parts are now severely degraded by shifting cultivation and its larger vertebrates have been exterminated (UNCBD, Article 7). FORRU operates a tree-planting programme with a local hill tribe village to prevent further loss and promote recovery to maintain the locale's high biodiversity (UNCBD, Article 8).

12. In what ways can this project be considered a Darwin project? How does the project relate to the Darwin principles? How would the project be advertised as a Darwin project and in what ways would the Darwin name and logo be used?

This is a collaborative project between Chiang Mai University (CMU) and the Royal Forest Department (RFD) in Thailand and Horticulture Research International (HRI) in the UK. It was initiated by CMU, building on links with Dr David Blakesley, now at HRI, established during the past eight years (UNCBD, Article 18), and developed by all three institutions to tackle the escalating threat to biodiversity caused by loss of natural tropical forest. Biodiversity in northern Thailand is extremely rich, but poorly understood and severely threatened. Many established reserves and national parks contain large areas of degraded forest which urgently need restoration. The Biodiversity Convention (1992) identified the restoration of degraded ecosystems as an important component of in situ conservation, but research in this area has been severely neglected (UNCBD, Article 8). Local people desperately need support to develop and implement remedial actions where biodiversity has been reduced by human intervention (UNCBD, Article 10). This Darwin project will assist CMU and the RFD to build lasting local capacity to restore degraded tropical forests in northern Thailand. British expertise will be provided by Dr David Blakesley (HRI), who will work in the UK on the production of environmental educational material, and who will make advisory visits during the project and by Dr. Stephen Elliott stationed full time at Chiang Mai University. Through workshops, we will train local individuals at several levels to stimulate ecosystem restoration (UNCBD, Articles 8, 10, and 12). Trainees will act as catalysts during and after the project, demonstrating the techniques developed, initiating further restoration projects and training others. The research being analysed and described has focused on the degraded forests in Doi Suthep-Pui National Park. CMU and RFD maintain nursery facilities and demonstration field plots in DSPNP. Educational activities aimed at the urban population and NGO's of Chiang Mai will allow the project to raise awareness of the value of biodiversity and the means needed to conserve it in situ (UNCBD, Article 13). The principles of the Darwin Initiative and the specific aims of this project will be explained through local newspaper coverage, popular talks, and a poster and leaflet in Thai and English. The Darwin logo will appear on all educational material; workshop and lecture announcements; technical reports; and signs at demonstration sites. Darwin funding will be fully acknowledged in all publications. In addition, the Darwin logo will be closely associated with a network of trainees implementing the training and educational material received under this programme.

13. Set out the proposed timetable for the work, including the programme's measurable outputs using the attached list of output measures.

PROJECT OUTPUTS		
Year/Month (starting April)	Output Number (see standard output measures)	Description (include numbers of people involved, numbers of publications printed or produced and days/weeks where applicable)
yr1/Apr.	6A & 21	Recruit four people to constitute Forest Restoration Extension Team,
yr1/Apr. to Oct.	6B	SE (DB) to train Forest Restoration Extension Team of four people
yr1/Apr. to Oct.	17B	Maintain/update database of groups involved in forest restoration. Use database to contact & determine training needs of various groups
yr1/Jul to Sep., then every 4th month (yrs 1-3)	16A & 16B	Compile/distribute 300 copies of 10 issues of 'Reforestation Network' Newsletter outlining extension programme & reporting project progress. Establish and update website concurrently
yr1/Apr. to Oct.	7	Assemble education aids: workshop info. packs, audiovisual show, catalogue of images, video, posters
yr1/Sept. then bimonthly (yrs 1-3)	6A, 6B & 14A	One workshop to launch extension programme, then Bi-monthly workshops (60 days total) at FORRU for total of 300 villagers, NGOs or RFD officials
yr 1-3, weekly start Sept. yr1	6A & 6B	Weekly visits (120 days total) to/from schools; follow-up visits to assist with school nursery and tree planting projects (reach 3-5000 children)
yrs 2-3	6A & 6B	On site training at forest restoration projects with NGOs etc, on demand
yrs 1-3	9 & 11B	DB (SE) compile/analyse existing FORRU data & publish Forest Restoration Manual and 4 research papers
yr2/Aug; yr3/ Jun and Mar.	14A, 15A, 15C, 18A, 18C, 19A, 19C	Three workshops with press/TV/radio releases to assess utilisation of information by trainees, value and sustainability of the programme

Key Milestones	
Year/Month (starting April)	Description (include travel dates, drafts and other processes that support the delivery of outputs)
yr1/May	DB to Chiang Mai for detailed discussions on Manual content, plus contribute to Extension Team training
yr1/Apr - yr2/Aug	Compile and analyse existing data (FORRU's previous research programme) for Forest Restoration Manual
yr1/Oct.	SE to HRI for editorial work on Manual, plus report on first workshop and implications for future workshops
yr1/Jan.	DB to Chiang Mai for editorial work on Manual, and to attend third workshop plus school visit
yr2/Aug.	SE to HRI for completion of editorial work on Manual
yr2/Sept.	First draft of Forest Restoration Manual published in Chiang Mai
yr2/Oct. to Mar.	'Field trials' of Manual at workshops
yr2/Mar.	DB to Chiang Mai to attend final workshop where Manual on trial. Plan editorial work for revised text
yr3/Apr. to Sept.	Revision of text, image research, layout & design, printing
yr3/Aug	SE to HRI to finalise Manual, prior to printing in Chiang Mai and finalise plans for effecting exit strategy
yr3/Oct.	Manual launch and subsequent distribution
yr3/Mar.	Workshop to assess effectiveness of training (SE/DB)
yr1/Apr. to Oct.	Recruit and train Forest Restoration Extension Team
yr1/Apr. to Oct.	Establish links with NGOs, villages, RFD officials interested in forest restoration
yr1/Apr. to Oct.	Assemble education aids: workshop information packs, audiovisual show, catalogue of images, video, posters
yr1-3	Production of Annual Reports

14. Do you know of any other individual/organisation carrying out similar work? Give the details of the work, explaining the similarities and differences.

We are unaware of any research programmes similar to our own, or which could produce substantial environmental educational material for training local people in appropriate restoration techniques for native tree species in South-East Asia's dry tropical forests. Propagation research at the ASEAN-Canada Forest Tree Centre, Thailand, and in the Royal Forestry Department involves mainly exotic species, not the vast majority of native tree species. Many of the techniques developed for exotic species are inappropriate for small-scale tree nurseries concerned with biodiversity conservation. Restoration techniques for degraded seasonal forests have been developed for other areas, eg tropical Australia & Costa Rica. However, northern Thailand has a distinct flora, environment and culture, which will determine the efficacy of particular methods. We have tested and refined techniques developed elsewhere and modified them to create a local paradigm for future restoration work in the region.

15. Will the project include training and development? Please indicate how many trainees will be involved, from which countries and what will be the criteria for selection. How will you measure the effectiveness of the training and will those trained then be able to train others? Where appropriate give the length of any training course.

Training Activity	Dates	Who will participate, how many will participate and for how long?
Training for Darwin Forest Restoration Extension Team	yr1/Apr. to Oct	SE (and DB) will train team of four for 6 months, who will then be responsible for carrying out training activities
Environmental education and training for restoring tropical forests	yr1/Sept. then bimonthly for project duration	Darwin Forest Restoration Extension Team will run bimonthly workshops to train 300 people from villages, NGOs and RFD.
Environmental education and training for restoring tropical forests	yr/Sept. then every week for duration of project	Darwin Forest Restoration Extension Team will run weekly visits to or from schools, including follow up visits to assist with school nursery and tree planting projects. Expect to reach 3000-5000 children

16. How will trainee outcomes/destinations be monitored after the end of the training?

At the end of each training session, feedback sessions and anonymous questionnaires will enable trainees to express their opinions as to the usefulness of the training. Furthermore, three workshops will be held during the project, at which former trainees will be invited back to FORRU to share their experiences following their training. The usefulness of workshops and educational materials will be evaluated during extension visits to forest restoration sites. In this way the long-term effectiveness of the training will be assessed and if necessary the training programme can be modified for improvement.

17. How is the work of the project expected to continue after the end of grant period? A clear exit strategy must be included.

The aim of this project is to pass on practical information, based on sound scientific research, to key members of local communities and organisations, who are responsible for influencing or training others i.e. village leaders, teachers, Forest Department and NGO training officers. If the project is successful, these key personnel will continue to pass on skills and knowledge to local people, using the Forest Restoration Manual as their main text, long after the project ends. Thus, within 3 years, the project aims to bring about a permanent improvement in local attitudes, ability and capacity to implement forest restoration that maximises biodiversity conservation. By the end of the project, dissemination of forest restoration skills and knowledge should, therefore, have become self-perpetuating, requiring few if any further inputs from the Darwin Forest Restoration Extension Team. The extent to which this condition is met will be assessed by a workshop and questionnaire in the third year of the project. If trainees are able to carry on disseminating information independently, then the Darwin Forest Restoration Extension Team will be disbanded and the project leaders will assist the extension team members to take up positions in government agencies or NGO's, where the skills they have acquired during the project will continue to be applied to biodiversity restoration. The project leaders will also assist any extension team members who wish to initiate their own biodiversity restoration projects with fund raising and project planning. If the project does not become self-perpetuating within 3 years, or there is a continued demand for extension, then FORRU will continue to support the extension team from its core funding and will undertake to raise any additional funds necessary from sponsors..

MONITORING AND EVALUATION

18. Describe how progress on the project would be monitored and evaluated in terms of achieving its aims and objectives, both during the lifetime of the project and at its conclusion. How would you ensure that it achieves value for money? What arrangements will be made for disseminating results? If applicable, how would you seek the views of clients/customers?

Dr Elliott and a Chiang Mai University administrator will monitor the project continually in Thailand, with visits by Dr. Blakesley. Dr Blakesley will monitor it in the UK, with visits by Dr Elliott. A detailed schedule of objectives and milestones will be prepared for the overall project in advance. Full yearly reports for the project will allow progress to be measured critically. Details will include; progress made on the production of the environmental educational material, and publication where appropriate; workshops held, including participant lists, summaries of workshop questionnaires, and any actions to be taken as a result of this participant feedback. Organisations sending participants to workshops will be invited to join a 'Reforestation Network', and will receive new educational materials when available. Following an International Conference on 'Forest Restoration for Wildlife Conservation', hosted in January 2000 by FORRU, with ITTO support, FORRU now has a database of groups in SE Asia involved in tree planting, and will use this to publicise the Darwin educational material outside the immediate locality.

Consequently, progress and cost-effectiveness will be regularly assessed, and efficient project management enabled. Financial administration in the UK will be undertaken by Horticulture Research International and in Thailand by Chiang Mai University/FORRU. Financial support, and support 'in kind' by the partner institutions is indicated in the budget tables A and B, and boxes 22 and 23.

Logical framework. Please enter the details of your project onto the matrix using the note at Annex B of the Guidance Note.

Project summary	Measurable indicators	Means of verification	Important assumptions
<p>Goal</p> <p><i>To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the Biodiversity Convention</i></p>		<p>Personnel implementing forest restoration projects will be trained how to monitor biodiversity in planted plots. Results will be shared at workshops and through the network.</p>	<p>1. Thai government policies will continue to promote forest restoration by planting of native tree species</p> <p>2. Integration of community forestry with forest conservation will continue</p>
<p>Purpose</p> <p>To build lasting capacity to restore forests on degraded land for biodiversity conservation through improved forest restoration and biodiversity monitoring practices, based on sound scientific research.</p>	<p>Adoption of the methods described in the education material and workshops by communities and groups implementing forest restoration projects, leading to the initiation of new projects or improvement of existing projects, by 2003.</p>	<p>1. Initial knowledge uptake by questionnaires at the end of each training session.</p> <p>2. Long-term knowledge use determined at 3 evaluation workshops and by extension visits to project sites.</p> <p>3. Independently reviewed annual Project Reports</p>	<p>1. The existing local demand for forest restoration knowledge will continue or increase.</p> <p>2. Local people will be receptive to the information and training methods provided.</p> <p>3. Local people will have the resources needed to put their education and training into practice.</p>
<p>Outputs</p> <p>-Forest Restoration Manual - Educational aids for workshops etc: a/v show, images catalogue, videos, workshop info. pack, posters -15 workshops training 300 individuals -120 school education events reaching 3-5000 children -On site advice provided during extension visits -Newsletter for 'Reforestation Network'</p>	<p>-Publication date and demand for the Forest Restoration Manual, peer review, in 2003 -Fifteen workshops held, participant numbers and affiliation, participants feedback, questionnaires, 2001 - 2003 -Three workshops specifically to assess effectiveness of Education & Extension programme 2002</p>	<p>-Presentation of Manual, and peer review -Presentation of educational material -Participant list for workshops, plus completed questionnaires -Report on two 'effectiveness' workshops -Record of participating schools -Independently reviewed annual Project Reports</p>	<p>-Thai government policies will continue to advocate the planting of native tree species in degraded forest -Co-operation of local people in attending workshops -Public enthusiasm for tree planting will continue</p>
<p>Activities</p> <p>-Compile/analyse existing data from FORRU's research programme -Edit and publish Forest Restoration Manual -Recruit and train four Education Officers -Establish links with NGOs/villages/RFD officials interested in forest restoration -Organise/carry out training workshops and school visits</p>	<p>-Budget of £157560, of which £128345 requested from Darwin -Expertise of Drs Blakesley and Elliott -Expertise of Darwin Education Officers -FORRU nursery, office and field plot facilities -CMU herbarium and office space for programme</p>	<p>-Annual project report for Darwin, detailing progress on the Forest Restoration Manual, and education and extension programme -Audit of budget holders (HRI and CMU/FORRU)</p>	<p>-Suitably qualified and motivated staff can be found to carry out the tasks required by the project -Co-funding will continue to support existing FORRU facilities and research personnel -Continued agreement of the Royal Forestry Department</p>