

HOW TO PLANT A FOREST:

THE PRINCIPLES AND PRACTICE OF RESTORING TROPICAL FORESTS

*“We climb the highest mountain.
We’ll make the desert bloom.
We’re so ingenious; we can walk on the moon.
But when I hear of how the forests have died,
salt water wells in my eyes.”*

- Julian Lennon



THE FOREST RESTORATION
RESEARCH UNIT (CMU)

COMPILED BY
STEPHEN ELLIOTT, DAVID BLAKESLEY, J. F. MAXWELL,
SUSAN DOUST AND SUTTHATHORN SUWANNARATANA

ARTWORK BY SURAT PLUKAM

SPONSORED BY THE UNITED KINGDOM'S
DARWIN INITIATIVE

FIRST EDITION 2006



“How to Plant a Forest” is also available in Thai. Adaptations in Chinese, Lao and Khmer are being prepared. This book has no copyright and has been designed to be easily reproduced. All we ask is that proper acknowledgement is made as to the origin of the material. **Please cite as:**

FOREST RESTORATION RESEARCH UNIT, 2005. How to Plant a Forest: The Principles and Practice of Restoring Tropical Forests. Biology Department, Science Faculty, Chiang Mai University, Thailand.

Additional copies (in English or Thai) are available from The Forest Restoration Research Unit, c/o Dr. Stephen Elliott or Dr. Sutthathorn Suwannaratana. For contact details, see page 200.

ISBN.....

Cover Photographs

Top - Deforested, cultivated, abandoned, burnt and degraded, the watershed above Ban Mae Sa Mai in Doi Suthep-Pui National Park is typical of areas suitable for forest restoration.

Bottom - The same area, 7 years after planting 30 framework tree species.

Centre - Planting a tree, with cardboard mulch to reduce weed competition.

DEDICATION

This book is dedicated to the memory of M.R. Smansnid Svasti (1932-2003), better known to her friends simply as “Nunie”. A keen naturalist, Nunie was instrumental in helping us to establish FORRU-CMU. Her vision that forests in northern Thailand could be replanted and her enthusiasm for our work continue to inspire us today.



I shall miss her friendship and unwavering encouragement, her stimulating conversations and her insatiable curiosity during walks in the forest. But more importantly, the natural world has lost one of its most ardent defenders and is the more vulnerable for her passing.”

– Stephen Elliott (from Nunie’s memorial book, 2003)

Nunie relaxes after her presentation entitled “Rivers in Jeopardy” at the workshop “Forest Restoration for Wildlife Conservation”, organized by FORRU-CMU in 2000 and sponsored by the International Tropical Timber Organization.

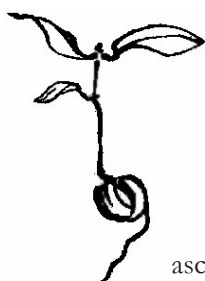


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ACKNOWLEDGEMENTS

This manual cannot be ascribed to a single author or even a small group. The information within it has been contributed by the many people who have participated in the research and education programs of Chiang Mai University's Forest Restoration Research Unit (FORRU-CMU) since 1994. The compilers listed on the title page are those who have collated information that has been generated over more than a decade.

This manual is one of the outputs from the project entitled "Education and Training for Restoring Tropical Forest Biodiversity", sponsored by the United Kingdom's Darwin Initiative. We are very grateful to the Darwin Initiative for sponsoring production costs and for arranging review of the first draft.

FORRU-CMU was co-founded by Assoc. Prof. Dr. Vilaiwan Anusarnsunthorn, Dr. Stephen Elliott and Dr. David Blakesley in 1994, within Chiang Mai University's (CMU) Biology Department and in association with the Headquarters staff of Doi Suthep-Pui National Park, where the unit's research nursery was built. We are especially grateful to all the park chiefs who have provided logistical support for the unit over the years, including Mr. Prawat Wohandee, Mr. Amporn Panmongkol, Mr. Wirote Rojanajinda, Mr. Suchai Omapinyan, Mr. Paiboon Sawetmalanon, Mr. Prasert Saentaam, Mr. Anan Sorngai and Mr. Surachai Tuamsomboon.

This book would not have been possible without the dedicated work of FORRU's staff, both past and present, including Ms. Siriporn Kopachon, Ms. Kittiya Suriya, Mr. Puttipong Navakitbumrung, Mr. Cherdasak Kuaraksa, Mr. Greuk Pakkad, Ms. Panitnard Tunjai, Ms. Narumon Tantana, Ms. Thonglaw Seethong, Ms. Jahmbee Bunyadit, Ms. Somkit Kungotha and Mr. Kunya Seethong. FORRU's Darwin Education Team, provided much feedback on earlier drafts of the book, including Ms. Nate-
napit Jitlam, Mr. Wasun Leerat, Mr. Kunakorn Boonsai, Mr. Thanakorn Lattirasuvan, Ms. Sudarat Zangkum, Ms. Narrisa Pongsopa. Ms. Rungtiwa Bunyayod helped with layout and designed the Thai edition.

Over the last ten years, FORRU benefited greatly from fresh ideas brought in by many volunteers including Mr. Daniel Blackburn, Mr. Alan Smith, Ms. Anne Sinclair, Mr. Simon Gardner, Ms. Pindar Sidisunthorn, Mr. Derek Hitchcock, Mr. Kevin Woods, Ms. Janice Kerby, Mr. Tim Rayden and Ms. Amanda Brigden. In particular, Australian Youth Ambassador, Mr. Kirby Doak provided substantial input into Part 8 of the book and Ms. Susan Doust drafted Part 9. We also thank Dr. Kate Hardwick, for her intellectual input during FORRU's formative years. The late M.R. Smansnid Svasti and the late Mr. Mark Graham are fondly remembered for their assistance with establishing the unit.

The framework species method of forest restoration was first conceived in Queensland Australia and we are indebted to Mr. Nigel Tucker and Ms. Tania Murphy for training FORRU-CMU staff in the concept at Lake Eacham National Park, Queensland, in 1997. Dr. Nancy C. Garwood from the Natural History Museum, London, U.K. also provided training for FORRU's staff during the unit's establishment phase.

Collaboration with the villagers of Ban Mae Sa Mai has been essential for the success of this project, particularly the establishment of the experimental plots there. We thank Mr. Naeng Thanonworakun, Mrs. Nahor Thanonworakun and their family, for taking care of the village tree nursery and for co-ordinating our work with the community.

FORRU-CMU was founded with sponsorship from Riche Monde (Bangkok) Ltd. Its research has subsequently been supported by Chiang Mai University, Thailand's Biodiversity Research and Training Program, The U.K.'s Eden Project, Shell International Renewables and Guinness PLC. Other donors have included the British Embassy in Bangkok, the British Council, The Fagus Anstruther Memorial Trust, The Peter Nathan Trust, The Robert Kiln Charitable Trust, the Barbara Everard Trust for Orchid Conservation, The Rotary Club of Cleveland, Tennessee, The Pondan Project, Mr. Alan and Ms. Thelma Kindred, Mr. Nostha Chartikavanij, Mr.



R. Butterworth and Mr. James C. Boudreau. We thank them all.

The text of this book was compiled by Dr. Stephen Elliott, Dr. David Blakesley and Ms. Susan Doust. The Thai edition is being adapted by Dr. Sutthathorn Suwannaratana. J. F. Maxwell identified all plants mentioned in the text and made significant improvements to drafts of Parts 2 and 9. All artwork is by Mr. Surat Plukam, unless otherwise attributed. Photographs were taken by FORRU-CMU staff.

All opinions expressed in this book are those of the compilers and not necessarily those of

the sponsors or reviewers. The compilers would like to take this opportunity to thank anyone, not already mentioned above, who has contributed in any way towards FORRU-CMU's work or the production of this book.

Finally we are grateful to the Biology Department, Science Faculty, Chiang Mai University for institutional support of FORRU, since its inception and East Malling Research (formerly Horticulture Research International) for institutional support of Dr. David Blakesley and for acting as collaborative U.K. partner for Darwin Initiative projects.



Dr. David Blakesley of Wildlife Landscapes, FORRU's Co-founder and long-term Research Advisor.

Mr Naeng Thanonworakul, Nurseryman and community motivator at Ban Mae Sa Mai, hugs a 5-year old Spondias axillaris tree.



The FORRU Team at CMU, early 2005. From left to right: Ms Panitnard Tunjai (Researcher), Dr. Stephen Elliott (Co-founder), Dr. Vilaiwan Anusarnsunthorn (Co-founder), Mr J. F. Maxwell (Plant Taxonomist), Dr. Sutthathorn Suwannaratana (Education Management), Mrs Rungtiwa Bunyayod (Secretary), Mr Cherdasak Kuaraksa (Senior Researcher), Dr. Greuk Pakkad (Senior Researcher), Ms Sudarat Zangkum, Mr Kunakorn Boonsai and Ms Narissa Pongsopa (all Darwin Education Officers) and Ms Susan Doust (Australian Youth Ambassador).



A MESSAGE FROM U.K. ENVIRONMENT MINISTER, ELLIOT MORLEY M.P.

Destruction of tropical forests is probably the greatest threat to the enormous variety of plant and animal species, with which we share our planet. Although tropical forests cover only 7% of Earth's land surface, they are home to more than half of the world's plant and animal species. In addition, they provide local people with a wealth of forest products; reduce damage caused by floods and droughts and generate revenue as tourist attractions. Yet these forests are fast disappearing.

In response to the global biodiversity crisis, the British government established the Darwin Initiative in 1992 to promote the use of U.K. expertise to work in partnership with countries rich in biodiversity but lacking all the resources needed to conserve it. So far, this initiative has provided grants totalling £ 35 million to 350 projects to promote biodiversity conservation around the world.

In 2002, the Darwin Initiative awarded a grant to Horticulture Research International¹ and the Forest Restoration Research Unit (FORRU) of Chiang Mai University in northern Thailand for a project entitled "Education and Training for Restoring Tropical Forest Biodiversity". This project established an education unit to teach local people how to restore tropical forest ecosystems, with the specific aim of promoting biodiversity recovery. The education program was based on original research by FORRU-CMU since 1994, which had shown how it is possible to re-establish closed

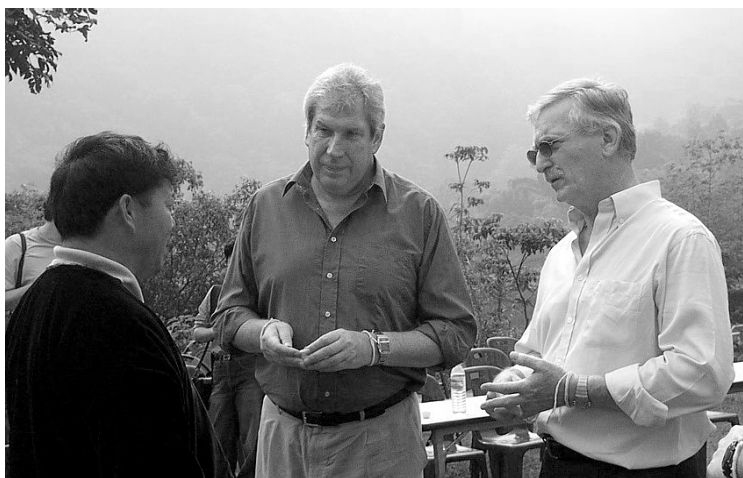
canopy, tropical forest within 3-5 years after planting 30 or so indigenous tree species, carefully selected for their ability to shade out invasive weeds and attract seed-dispersing animals, which accelerate biodiversity recovery.

Through workshops and other educational activities, this project has enabled more people to become involved in restoring Thailand's once magnificent forests and has helped to improve the efficiency of existing reforestation projects. In addition to passing on technical expertise, the project has also developed innovative ways to encourage local communities to become involved in forest restoration.

In 2004, I visited one of these communities, Ban Mae Sa Mai in Doi Suthep-Pui National Park, and witnessed, at first hand, how this project has generated both a tremendous enthusiasm for forest restoration amongst local people and the technical competence needed to implement it.

This manual is one of the outputs from this project. It provides a simple, accessible and practical guide so that others may apply the findings of the FORRU's research and become actively involved in restoring Thailand's forests. I am delighted that the Darwin Initiative has been able to contribute to its publication and distribution. It not only serves as a guide to the restoration of forests in Thailand, but also as an example for other countries to emulate.

Elliot Morley



U.K. Environment Minister, Elliot Morley, M.P. chats with the Headman of Ban Mae Sa Mai, Kuhn Manat Thanonworakul and the U.K. Ambassador to Thailand, H. E. Mr. David Fall during his visit to FORRU-CMU in 2004.

¹Now renamed East Malling Research (EMR)





FOREWORD

BY PROF. VISUT BAIMAI,
DIRECTOR OF THAILAND'S
BIODIVERSITY RESEARCH
AND TRAINING PROGRAM (BRT)

Like many tropical countries, Thailand faces a biodiversity crisis. As forests are cleared for development and agriculture, the Kingdom's immensely rich flora and fauna are decimated. Recognizing this problem, the Biodiversity Research and Training Program was established in 1995 to support research on the conservation and sustainable use of biological resources.

Since 1998, BRT has helped to sponsor the pioneering efforts of Chiang Mai University's Forest Restoration Research Unit (FORRU-CMU) in its mission to discover how to recreate biodiversity-rich forest ecosystems where they have been destroyed. This research has resulted in notable success. The unit has developed experimental tree nurseries and an impressive system demonstration plots, where forest has been restored in just a few years, by adapting the so-called "framework species" approach to forest restoration. Many bird and mammal species have rapidly re-colonized these newly planted forests, bringing with them the seeds of more than 60 other (non-planted) tree species.

This book presents the results of that research in a user-friendly format, so that anyone interested in restoring forest ecosystems can do so efficiently and effectively. With its optimistic message that **"deforestation can be reversed"**, this book provides the means to restore biodiversity where it has been depleted, by re-establishing habitat for thousands of plant and animal species.

In addition to clear "how-to-do-it" instructions, the book also provides readers with a basic understanding of forest types and natural forest succession, so that the techniques described can be adapted to various local conditions. There is something in this book for everyone who cares about Thailand's biodiversity and forests, from school children joining their first tree-planting event, to government officials responsible for planning nation-wide reforestation programs.

I am proud of BRT's contribution to the research that generated much of the original information presented in this book and I hope that everyone who reads it will be inspired to get directly involved in restoring our nation's forests and our biological heritage.

