

**How to Plant a Forest: The Principles and Practice of Restoring Tropical Forests**, compiled by Stephen Elliott, David Blakesley, J. F. Maxwell, Susan Doust & Sutthathorn Suwannaratana. Forest Restoration Research Unit, Biology Department, Science Faculty, Chiang Mai University, Thailand, 2006. Pp. VIII + 200. ISBN 974-656-945-7.

How to plant a forest is the product of 10 years research and practice by FORRU, the Forest Restoration Research Unit at the Biology Department of Chiang Mai University. FORRU was established in 1994 with the aim to generate knowledge and experience for restoring forests on degraded or deforested sites in Northern Thailand. Forest restoration is not reforestation! While reforestation means the re-establishment of any kind of tree cover which may include even plantation forests, forest restoration is the re-establishment of the original forest ecosystem that existed before deforestation. FORRU's achievement was to adapt the "framework species method" for forest restoration, which had been pioneered in Queensland, Australia, to the forests and environmental conditions of Northern Thailand. Framework species are indigenous tree species that are capable of improving site conditions on deforested or degraded land, and of re-establishing natural mechanisms of forest regeneration. They are planted in order to initiate and accelerate the process of forest restoration. Essential steps in the process of adapting this method to the conditions of Northern Thailand were to identify suitable framework species, and to develop methods for their propagation in nurseries and on restoration sites. This involves more than just studying the ecology and suitable horticultural treatment of candidate species, even though it is in these areas that FORRU has carried out a lot of valuable research, e.g. by carrying out germination trials for more than 400 native tree species.

For successfully restoring forests, it is also important to obtain the support of local communities or, even better, to get them involved in restoration activities. FORRU has developed a successful cooperation with the community of Ban Mae Sa Mai in Doi Suthep National Park. It carries out its forest restoration activities on land formerly used by the villagers for farming, and has established a community tree nursery in the village in 1997. Villagers participate actively in the restoration operations and also obtain benefits from ecotourism generated by the project. Within a relatively short period, FORRU has thus accumulated knowledge and working experience over a wide range of areas, which can be used for replication in other places. *How to Plant a Forest* has been written to make FORRU's experience available to a broad audience, and to encourage others to engage in forest restoration activities. Versions of the book in Thai, Vietnamese, Mandarin, Khmer and Laotian are under preparation.

This is the latest and most comprehensive publication coming out of FORRU activities. Previous publications include a number of scientific papers, and a very well-prepared and beautifully illustrated booklet on the seeds and seedlings of 45 native tree species useful for forest restoration (FOREST RESTORATION RESEARCH UNIT, 2000). *How to Plant a Forest* has been labeled by its compilers as a manual. It is, however, a lot more than just that. Apart from explaining in an easy to follow step-by-step manner, what the framework species method is, and how it can be applied in Northern Thailand, the book also provides a wealth of information and knowledge on the ecology of tropical forests in general, and of the forests in Northern Thailand in particular. It is therefore valuable reading not only for the practitioner, but also for those with a more general botanical, ecological or regional interest. A lot of the knowledge presented in this book has been generated by the project

itself over the 10 years of its activities. Another important source of knowledge is J. F. Maxwell's published database of plant species and forests habitats of Doi Suthep–Pui National Park, which probably makes Doi Suthep the floristically and ecologically best documented place in Thailand. The database has been especially valuable in providing information on the phenology of tree species, e.g. the seasonal cycles of fruiting and seed dispersal, which are of vital interest for forest restoration projects.

Especially valuable for those with an interest in the forests of Northern Thailand is Part 2, "Recognizing Forest Types", which is based on a forest classification system developed by co-authors of this book. It provides guidance on how to identify each forest type by using structural indicators that can be easily recognized by the lay-person, and lists the botanical names of common species of the various vegetation layers. It also discusses the special challenges of restoring the respective forest types. Equally important from the perspective of a forest ecologist is Part 3, "Understanding Forest Regeneration", which contains a lot of valuable information on the ecology of seasonally dry tropical forests, a lot of which, again, has been generated "locally", such as the insight that only 29 percent of the tree species in Doi Suthep–Pui National Park are wind-dispersed, which indicates how important seed dispersal by animals is in tropical forests. Some views held by the authors on forest ecology, e.g. their decision to hold on to the time-honored concept of a stable climax that is in harmony with environmental factors, are at odds with more recent views on the role of disturbances which, for instance, see fire as an inherent part of the ecology of certain forest types such as deciduous dipterocarp forest. The authors' bias against fire is understandable because of the focus of FORRU activities on evergreen forests, and because of their principal interest in getting forests established in the first place—they make it very clear that fire is the greatest hazard and fire fighting or prevention the most important cost factor in forest restoration projects! Long-term management of deciduous or partly deciduous forests may, however, call for a rethinking of, and more research on, the role of fire.

More exclusively addressed to restoration practitioners are Parts 5 to 8, which meticulously explain every step in the process of restoring a forest according to the framework species method: from selecting and testing framework species, to growing trees in a nursery and planting them out, and finally to planning a restoration strategy and getting communities involved. The strength of these chapters lies in the fact that the recommendations and instructions have obviously been tried out over years and thus carry the full weight of experience. The book closes with an annotated list of 41 forest tree species native to Northern Thailand which have been proven by FORRU's research program to act effectively as framework species.

FORRU is an excellent enterprise, and *How to Plant a Forest* is a very good book, which combines the qualities of a science textbook with those of an instruction manual. It is written in plain and accessible language, and is richly endowed with illustrations: photographs, water colors, and especially the excellent line drawings of plants and plant parts by Surat Plukam. It is to be wished—in the language of forest restoration—that the book may be dispersed rapidly and widely, and that its ideas and recommendations may get established effectively and reproduce sustainably.

## REFERENCES

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