

## FOREWORD

For scores of species with small and declining populations, human intervention is usually needed to ensure their survival. We are responsible for the whole planet, gardeners in effect, and can find sustainability only through continuing, effective efforts. The Center for Plant Conservation (CPC) and its partners in science and land management have aggressively promoted conservation of the plants of the United States for the past quarter century. These efforts have international support and global appeal. The present volume has been made possible because of CPC leadership; its appearance is both timely and welcome.

The successful reintroduction of plant species into natural habitats has never been a simple matter. In their conservation efforts, botanical gardens have long used this strategy, because it is the most cost effective and long lasting that we have devised. Even at a basic level, however, reintroduction is chancy because of stochastic events such as fire, flood, and drought; the appearance of invasive species of plants and animals; the spread of diseases and pests; competition with other plants; and now climate change.

Global climate change, limit its extent as we may, makes the prospects for species survival and successful reintroduction bleaker than we have thought. For example, it is projected that more than half of the roughly 2,400 endemic plant species of California may be on the way to extinction by the end of the century as their habitats are wiped out (Loarie et al. 2008). Similar calculations have been made for other areas, such as habitats at higher, cooler elevations, and coastal species subject to sea-level rise (Walther et al. 2002). We need precise models to identify areas suitable for reintroduction, and we need our best efforts to get it right. Seedbanks will also be of increasing importance in the future.

A critical situation arises when suitable habitats are completely eliminated in the areas to which the plants of concern are restricted. For example, by any of the accepted models of climate change, all above-timberline habitats in the lower forty-eight states will be eliminated in the twenty-first century (Grace et al. 2002; IPCC 2007; Williams et al. 2007). Should we then attempt to establish these plants further north? What about plants from the cooler parts of the Southern Hemisphere, or the Arctic? There appears to be nowhere to establish them in the world of the future. If we introduce plants to areas where they have not grown before, what will be the consequences? The science and practice of conservation ecology will need to be refined and developed greatly if we are to make sound decisions in these areas over the decades to come.

No matter what problems we are facing now or will encounter in the future, we clearly must continue our efforts to understand the factors involved in successful reintroduction. Although the process remains challenging, often yielding uneven results, we are making progress by using our best knowledge of ecology, population biology, genetics, horticulture, and other relevant fields and by working collaboratively. Overall, the present volume makes a particularly valuable contribution, and one that is sure to be widely appreciated.

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