

Preface

We were delighted to be invited to contribute to the prestigious Ecology, Biodiversity and Conservation series published by Cambridge University Press because, when compared to the conservation of animals, too little attention is directed to the conservation of plants. As Kay Havens has emphasised, citing the example of federal funding in the US, spending on threatened and endangered animals is thousands of times greater than on plants. More positively, however, our experiences of working with botanic gardens have persuaded us of the incredible importance and potential contribution of the global community of some 2670 botanic gardens.

However, we approached the task with considerable trepidation. Conservation biology is a fast moving and often controversial field. A wide diversity of opinions exist even over the fundamental definitions and goals of conservation. At its narrowest, plant conservation is often conceived as focusing on the survival of a single endangered species or the designation and protection of a particular area important for its plants. At the other end of the spectrum, conservation is seen as the actions needed to preserve ecosystem services, or evolutionary potential, or the wider efforts needed to secure a healthy biosphere in an era of global change. The extent of these controversies and the passion with which the protagonists present their case is demonstrated by several continuing debates.

These have seen, for example, a traditional focus on conservation in protected areas set against counter arguments that too little of the natural world, if any of it actually remains, is represented within protected areas. The case is also made that protected areas cannot be isolated from or protected against climate change, especially in an era of global change. The definition and relevance to conservation of novel ecosystems has been hotly debated with some arguing that even accepting that conservation can be conducted in novel landscapes provides developers with a licence to destroy what little remains of pristine ecosystems and their

biodiversity. Efforts to repair the damage done, especially since the Industrial Revolution, are equally contentious. There has been intense discussion of the scope, aims and methodology of ecological restoration and the validity of rewilding. There are those who argue for the necessity of assisted migration of threatened species and those who consider it heavy-handed interference. For many years the idea of *ex situ* conservation of threatened plants in botanic gardens, arboreta or seed banks was seen as an admission of failure. Only continuing survival *in situ* could be considered a true conservation success. There are those who still hold to this view.

Strongly divergent opinions are also held on who the principal players are in plant conservation. Is it those who manage protected areas whether they be private individuals, agencies of government or in international programmes such as UNESCO's Man and the Biosphere Programme? Is it the professional forestry community who manage many of the world's forests or those conservation agencies, mining corporations and others who focus on ecological restoration? What is the role of the scientific community in conservation, as theoretical researchers or hands-on practitioners? Many have questioned whether botanic gardens, the focus of this book, even have a significant role to play in conservation beyond the cultivation or seed banking of rare species *ex situ*.

We reject the polarised perspectives that are so often presented on such issues. They follow a time-honoured form of academic discourse, but in nature one size does not fit all. Conservation is a highly complex field, mirroring the complexity of the biodiversity it aims to protect. Consequently, very different approaches are required in different contexts.

There are undoubtedly roles for many players, the more the merrier, given that present efforts are failing to deliver on the internationally agreed agendas of the multilateral environmental agreements. It is equally certain that while protected areas will continue to have enormous importance as the 'best' pieces of our planet, novel ecosystems and agricultural or urban landscapes represent the only future home for many species and must also be part of the mix. Future generations will judge us for the biodiversity we protect and bequeath them, not for the quality of our academic debates in a time of biodiversity crisis and unprecedented environmental change.

Botanic gardens have a unique role to play as centres of expertise in plant diversity and holders of living collections of much greater diversity than are held by any other professional organisations concerned with

plants. However, they alone are not sufficient to face the challenges of the Anthropocene. Botanic gardens must continue to diversify the range of partners they work with in order to maximise their contribution to the biodiversity crisis and they must step up the scale and intensity of their efforts to conserve plants. There have been many plant extinctions since humanity encircled the globe and already there are dozens, perhaps hundreds, of species, extinct in the wild, which survive only in cultivation within living collections or seed banks.

We hope, therefore, that this book will show not only what is already being accomplished by botanic gardens in the field of conservation but also what might be possible if and when botanic gardens join forces with the widest possible community of interest, to work together for a green planet. Only a, literally, green world can sustain us and the millions of other species with which we share this planet for the future.