

### Species Conservation

### Lessons from Islands

This book brings together leading conservation practitioners to reflect on their response to the current global biodiversity crisis through the lens of island species recovery and management. Initial chapters cover the biological understanding of small-population biology and the growing threat of invasive species, while subsequent chapters discuss the management of these threats and the complexity of leading projects within a dynamic and still relatively unknown system. Multiple case studies from islands worldwide illustrate key points, allowing readers to draw on the first-hand practical experience of respected professionals. This resource will be invaluable to both current and future conservation professionals, helping them to go beyond disciplinary 'comfort zones' and develop, manage and lead projects over extensive time frames in a way that brings others with them on the journey.

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The world's biological diversity faces unprecedented threats. The urgent challenge facing the concerned biologist is to understand ecological processes well enough to maintain their functioning in the face of the pressures resulting from human population growth. Those concerned with the conservation of biodiversity and with restoration also need to be acquainted with the political, social, historical, economic and legal frameworks within which ecological and conservation practice must be developed. The new Ecology, Biodiversity and Conservation series will present balanced, comprehensive, up-to-date and critical reviews of selected topics within the sciences of ecology and conservation biology, both botanical and zoological and both pure and applied. It is aimed at advanced final-year undergraduates, graduate students, researchers and university teachers, as well as ecologists and conservationists in industry, government and the voluntary sectors. The series encompasses a wide range of approaches and scales (spatial, temporal and taxonomic), including quantitative, theoretical, population, community, ecosystem, landscape, historical, experimental, behavioural and evolutionary studies. The emphasis is on science related to the real world of plants and animals rather than on purely theoretical abstractions and mathematical models. Books in this series will, wherever possible, consider issues from a broad perspective. Some books will challenge existing paradigms and present new ecological concepts, empirical or theoretical models and testable hypotheses. Other books will explore new approaches and present syntheses on topics of ecological importance.

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### Foreword

### Islands in the Life of Gerald Durrell

Islands punctuated the life of British author and conservationist, Gerald Durrell. Although born in India, he often said that his life began on Corfu, an enchanting Greek island where he lived as a boy with his family in the 1930s. Gerry passed away on the island of Jersey in 1995, hailed around the world as an 'icon of nature conservation of the 20th century' (Gerald Durrell, personal communication).

Islands shaped Gerry's work, both literary and in conservation. As a youngster, he explored every nook and cranny of Corfu, seeking out wildlife, from earwigs to eagle owls, to nourish his growing passion for the animal kingdom. Here he met his mentor, Dr Theodore Stephanides, a Corfiot doctor whose eclectic interests in the natural world broadened and deepened the boy's view of nature. His most enduring and, some say, most endearing book described this magical childhood.

Gerry became an animal collector for zoos, travelling in West Africa and South America, but he became unhappy with the profligate attitude of zoos of the day towards the animals in their care, summed up by the phrase 'there are always more where they came from'. He determined to have his own zoo, one devoted to the conservation of wild species and their habitats

In 1959, Gerry settled on Jersey in the British Channel Islands, where both he and his modest zoo were warmly welcomed by the Islanders. The zoo found a niche in the budding tourism industry, and it flourished under the management of a charitable trust, now called the Durrell Wildlife Conservation Trust. Jersey Zoo became the standard-bearer for zoo conservation that Gerry had envisioned since his animal-collecting days, and the Trust began to undertake conservation action around the world from its headquarters in Jersey.

Its early efforts derived from Gerry's visits to the island of Mauritius in the 1970s. Mauritius was like a magnet to Gerry, because he had chosen the extinct dodo for the Trust's emblem, the large, flightless bird endemic to the island, which had perished at the hands of humankind. For



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Gerry, the dodo symbolised the fragility and vulnerability of species when encountering *Homo sapiens*, and he vowed that no species the Trust chose to help would follow the dodo to oblivion. He and his team brought about the recovery of several endangered Mauritian species when many other conservationists would have given up on them. The Trust developed a 'conservation toolbox' of techniques – breeding, research, training, community conservation and restoration of wild populations and habitats. Using the appropriate tools, the Trust continues to revive species and rebuild habitats around the world.

Gerry himself was profoundly inspired by islands, and his legacy owes much to them. Corfu kindled his devotion to the natural world, Jersey sustained his first tangible ideas for protecting it and Mauritius gave full rein to his vision that it is indeed possible to reverse the ecological havoc caused by our own species.

It is no coincidence that, two decades after Gerry died, I am writing these words from the deck of a ship on a voyage around the islands of the Indian Ocean. The itinerary did not include Mauritius this time, but we have visited many other islands – Madagascar, Anjouan in the Comoros Archipelago, Aldabra and Aride, both in the Seychelles – which reflect the full range of themes in this book.

Madagascar, lying in splendid isolation for nearly a hundred million years, rejoices in great biodiversity and endemism yet reveals many taxonomic gaps, as most islands do. The nearby Comoros are volcanic islands only a few million years old, sustaining far fewer species and more taxonomic gaps. People arrived on both Madagascar and the Comoros within the last 2,000 years, and the hand of humanity lies heavy on their species and habitats.

On remote Aldabra, in contrast, human intervention has been relatively light, with few visitors and fewer settlers. Although the endemic giant tortoise was nearly wiped out in the nineteenth century, exploitation of the flora and fauna has long been curtailed, and the eradication of invasive species is nearly complete. Aldabra now represents 'a superlative example of an oceanic island ecosystem in which evolutionary processes are active within a rich biota', according to World Heritage Site Criterion IX. It is also an utter delight to visit, to watch dainty Aldabra rails mince among the great moving boulders of giant tortoises and the occasional coconut crab doing the best it can to scuttle along, not easy for the largest land invertebrate.

On the spectrum of island isolation in time and space and of human intervention, Aride lies in the middle. As a granitic island, it is many millions of years old but is tiny (only 68 hectares) and appeared on no



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charts until the eighteenth century, when it was described as 'a pile of rocks covered with a few bushes'. Occupied in the next century by a leper colony and covered with coconut palms and vegetable and fruit plots, its vast seabird populations were plundered for meat and eggs. Aride could have become a wasteland, but thanks to timely conservation action, it is now a natural paradise, reminiscent of the Galapagos, with much of its fauna and flora restored and functioning as a natural island community should.

Islands expose the worst of our deeds and display the best of our endeavours, proving that it is possible for us not only to learn from our mistakes but also to rectify them. The research, training and conservation undertaken on islands, substantially presented here by the practitioners themselves in a readable mix of theory and case studies, offer hope for the future of the special and precious biota of islands. If islands can be construed as microcosms of the wider world, then there is also hope for the planet.

LEE DURRELL



Gerald Durrell providing supplementary food for a wild Mauritius kestrel *Falco punctatus* (c. 1987). A species brought back from four known individuals to 300–400 free-living birds. (From C. G. Jones, M. D. Burgess, J. J. Groombridge et al. 2013. Mauritius kestrel *Falco punctatus*, in R. J. Safford and A. F. A. Hawkins (eds.), The Birds of Africa, vol. VIII: The Malagasy Region. Christopher Helm, London. *Photo credit:* John Hartley.)





## Preface

'I want to know what you're going to do for me?', Carl Jones asked me as I sat next to him on his sofa in Wales, with one eye on daytime TV; this was definitely one of my weirdest and most memorable job interviews! I must have done all right, as the next thing I knew I was winging my way to Mauritius, fresh out of university, to volunteer for the Mauritius kestrel recovery team during the 1993-94 breeding season. So began my conservation career and a life to date unconsciously devoted to helping in some small way the recovery of threatened tropical island species. Mauritius taught me many things, the most significant one being that fieldwork was not my passion, but working with people was. Subsequently, I was delighted to realise that conservation requires a cross-disciplinary approach, increasingly recognising the value of anthropological, socio-economic, managerial and leadership skills, as well as those focused on developing our biological understanding of species, threats to their existence and how to support them. Everyone can find a significant role to play within the conservation community.

As a conservation trainer and facilitator, I have the opportunity to work and become friends with an eclectic mix of conservation professionals, each an expert in his or her respective field and some of whom have kindly contributed to the development of this book. My job has been to gather this expertise and direct it where it is most needed to help build capacity for conservation. Fortunately for me, the organisation to which I have dedicated much of my working life – the Durrell Wildlife Conservation Trust – prioritised tropical islands as their focus for conservation action and capacity building. This has meant that I've had the enviable task of bringing together friends and colleagues from across the conservation community to travel to locations such as Hawaii, the Galapagos Islands, Samoa, Fiji, the Philippines, St Lucia, Seychelles and, of course, Mauritius to work with individuals and organisations to help them save species from extinction. It was during a trip to the Galapagos Islands to run a training course on island species conservation



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that I sat down with Carl and my good friend Jim Groombridge, and we hatched a plan to write this book.

It was clear to us that members of the conservation community working to save threatened island species were missing a golden opportunity to learn from each other and avoid 'reinventing wheels'. In our travels, we witnessed fantastic examples of species recovery work, ranging from captive breeding of 'Extinct in the Wild' rails in Guam, to the restoration of multiple species and habitats in the Seychelles and Mauritius and to successful engagement of local communities in St Lucia resulting in the recovery of the island's national bird, the St Lucia parrot Amazona versicolor. Much of the knowledge that could be gleaned from these projects was not easily accessible through existing published literature, some of it sitting in internal reports and often just in certain people's heads! At the same time, we could see new projects starting up and longrunning projects faltering when they could have been greatly helped by knowing more about what others were doing. The parallels between these projects in terms of biogeographic and socio-economic context were clear. It seemed to us that we could help in some small way by capturing this knowledge and providing some shared insights into how species conservation projects function and what we can learn from others' success as well as failure. Going further, we hoped that by pulling this together we might also provide some 'food for thought' for species conservation projects happening worldwide, creating another point of connection between islands and how they continue to inform our understanding of life on Earth and how to manage it long term.

Since these initial thoughts, we have worked with a broader set of experts with deep knowledge of life on islands to help pen this book. Our aim has been to provide some personal insights, backed up with appropriate theory, and evidence from conservation action to save some of the world's most threatened species, which we hope will inform future conservation efforts on islands and beyond. We have not tried to provide a comprehensive overview of all the elements that could go into a species recovery project. For example, we do not unpick the complexities of climate change and how they are likely to impact island life, nor do we discuss in any detail human-induced habitat destruction, overkill or secondary extinctions. Instead, we take readers on a journey, from an understanding of the past history of life on islands to the present and how we prioritise, plan, manage and lead conservation projects in a way that enables us to learn as we go and improve our practice.



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The authors that contribute to this book have been selected based on their interest in and work on islands. I've had the pleasure of getting to know and learn from almost all of them during the various training courses Durrell has delivered over the last ten or so years. Their expertise ranges from understanding small-population biology and genetics, to the development of ecological histories and population monitoring, to invasive species management, to project planning and leadership, to species recovery, habitat restoration and public engagement in conservation action. Where possible, we have developed threads between the chapters, drawing readers' attention to related chapters where we can within the text.

The generation time for this book has been almost as long as that for an Aldabran giant tortoise! However, we hope that it will be received as a useful contribution to our understanding of life on islands and how to conserve it and go some way towards improving our effectiveness in recovering the growing raft of threatened species globally and saving more species from extinction.

JAMIESON A. COPSEY



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A number of us give a special thank you to Professor Carl Jones, MBE, who has been a first-rate mentor and friend and whose wisdom has greatly influenced us in our lives and careers in this wonderful, dynamic and challenging profession we call species conservation. Professor Michael Usher – as Series Editor – has been a guiding light throughout



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the process of finalising this book, which was for a number of us a new experience! Finally, we cannot end without making mention of Gerald Durrell, who inspired the Durrell Wildlife Conservation Trust: the organisation that we have all in some way been connected with over the years and that continues to set a benchmark for others to aim for.

