# Contents

The Arcus Foundation .......................................................... xi
Notes to Readers .................................................................. xi
Acknowledgments ................................................................. xii
Apes Overview ....................................................................... xiv

## Section 1
Disease, Health and Ape Conservation

Introduction ........................................................................ 1

1. Review of Ape Disease and Health ................................. 11
   
   Introduction ..................................................................... 11
   Wild Apes ........................................................................ 15
   Captive Apes .................................................................... 30
   Conclusion ......................................................................... 40

2. The Role of One Health at the Human–Ape Interface ........ 43
   
   Introduction ..................................................................... 43
   Ape Conservation, One Health and Sustainable Development 45
   A Short History and Core Principles of One Health .......... 46
   Globalization of the Principles of One Health .................. 49
   One Health and the Human–Ape Interface ....................... 51
   One Health in Action ....................................................... 58
   Conclusion ......................................................................... 74

3. The Impact of Tourism and Research Activity on Ape Health 77
   
   Introduction ..................................................................... 77
   Habituation: A Prerequisite for Ape Research and Tourism 80
   Risks to Habituated Wild and Captive Apes ................. 90
   Managing Disease-Related Risks in Apes ...................... 95
   Conclusion ......................................................................... 103

   
   Introduction ..................................................................... 109
   A Brief History of Ape Health Interventions .................. 112
   Reasons to Intervene and Skills Needed to Maximize Effectiveness 118
   Ethical Complexities Related to Vaccination ............... 123
   Informing Interventions at the Systems Level ............ 127
   Conclusion ......................................................................... 140

5. Ape Health and Ethics ......................................................... 143
   
   Introduction ..................................................................... 143
   General Ethical Considerations in Ape Care and Conservation 145
Contents

Compassionate Conservation and Managing Ape Health 147
Primary Prevention: Conservation and Interspecies Health Policy 150
Secondary Prevention: Responding to Injury 150
Tertiary Prevention: Respect for Autonomy and Care for Wellbeing in Sanctuaries 158
Moral Agency and Moral Courage in Ape Care and Conservation 158
Conclusion 159

6. Disaster Management and the Protection of Apes 163
Introduction 163
Disasters and Apes 166
Managing Risks to Apes 172
The Disaster Management Continuum with a Focus on Apes 178
Community Engagement in Disaster Management 192
Monitoring and Review 193
Conclusion 195

Section 2
The Status and Welfare of Great Apes and Gibbons

Introduction 198

7. Status of Apes: Impacts of Industrial Development Projects on Apes 201
Introduction 201
Ape Behavioral and Ecological Characteristics 204
Industries Prevalent in Ape Ranges 205
Impacts on Apes 206
Mitigation Approaches 208
Managing Cumulative Impacts 220
Long-Term Research and Monitoring 221
Moving Forward 224
Conclusion 230

8. The Welfare and Status of Captive Apes 233
Introduction 233
Section I: Improving Captive Ape Welfare 235
Section II: The Status and Number of Captive Apes 261

Annexes 274
Acronyms and Abbreviations 314
Glossary 317
References 328
Index 414