

Contents

<i>Foreword</i>	<i>page</i> xii
<i>Acknowledgments</i>	xiv
1 Introduction	1
2 Evolution and genetics	5
2.1 Description	5
2.2 Dwarfism and the island syndrome	7
2.3 Evolution of the island fox	8
2.4 Island foxes in the paleoenvironment	12
2.5 The peculiar genetic status of the island fox	13
2.6 Genetic management of captive island foxes	15
2.7 Future of wild populations	20
3 Social structure, reproduction, mortality and survivorship, and population dynamics	21
3.1 Social organization and reproductive behavior	22
3.2 Mortality and survivorship	24
3.3 Population abundance and dynamics	27
3.4 Factors affecting population dynamics	30
3.5 Modeling island fox population dynamics	32
3.6 Summary	33
4 Food habits, habitat use, activity patterns, and dispersal	34
4.1 Food habits	34
4.2 Dispersal and travel	38
4.3 Home range	39
4.4 Habitat use	40
4.5 Activity patterns	41
4.6 Summary	42

x · Contents

5	Golden eagles and the decline on the northern islands	43
5.1	Detecting change	43
5.2	Determining the cause	47
5.3	Golden eagle colonization of the northern islands	50
5.4	The vulnerability of island foxes to diurnal aerial predators	56
6	Ecosystem recovery: Predators and prey on the northern Channel Islands	58
6.1	Golden eagle removal	58
6.2	Long-term ecosystem recovery actions	66
6.3	Summary	71
7	Disease and decline on Santa Catalina Island	73
7.1	Declining populations	73
7.2	Initial results	75
7.3	Was disease the cause of the decline?	75
7.4	Recommendations for population recovery	76
7.5	Testing CDV vaccine	77
8	Recovery actions: Captive breeding of island foxes	81
8.1	Captive breeding efforts on the northern islands	81
8.2	Methodology and techniques	82
8.3	Demographic and genetic objectives of captive breeding	92
8.4	Low reproductive success	93
8.5	Summary	98
9	Recovery actions: Reintroduction and translocation	100
9.1	Translocation on Santa Catalina	100
9.2	Reintroduction on Santa Catalina	102
9.3	Reintroduction program on the northern islands	103
9.4	Success of reintroduction	111
9.5	Summary	113
10	Reproductive biology, by Cheryl Asa	115
10.1	Reproductive cycles	116
10.2	Captive breeding	117
10.3	Results of the monitoring study	123
10.4	Summary	127

	Contents	·	xi
11 Diseases of island foxes, by Linda Munson			129
11.1 Disease in island populations			130
11.2 Could viral disease explain the population declines?			131
11.3 Do other viruses infect island foxes?			133
11.4 Do non-viral pathogens infect island foxes?			134
11.5 Parasites infecting island foxes			134
11.6 Non-infectious diseases in island foxes			138
11.7 Genetic diversity versus disease resistance			140
11.8 Disease as a cause of death			141
11.9 Overall health of the island fox populations			142
12 Zoos, education, and public participation			144
12.1 Public advocacy			144
12.2 The role of zoos			146
12.3 Tachi and Finnegan			149
12.4 Environmental education			152
12.5 Summary			152
13 Managing recovery: Cooperative conservation, politics, and the Endangered Species Act			154
13.1 Stakeholders and recovery			154
13.2 A model for management: the Island Fox Conservation Working Group			156
13.3 Listing the island fox as endangered			158
13.4 Changes in island fox management due to listing			159
13.5 The benefits and challenges of ESA listing			163
13.6 Conclusion			165
14 The ecological role of island foxes			167
14.1 Introduction			167
14.2 Background			167
14.3 Prey response			169
14.4 Competitors			174
14.5 Island communities without foxes			176
14.6 Implications for research and management			177
15 Conclusion			180
15.1 Status			180
15.2 Future			181
<i>References</i>			185
<i>Index</i>			207