# Contents

Preface ix
Acknowledgements xi

## 1 Introduction

1.1 Conservation on farmland – why? 1
Species Box 1.1: Starfruit Plant (*Damasonium alisma*) 3
1.2 Historical relevance of on-farm conservation 4
1.3 Legislation and policy 6
1.4 Impact of agricultural policy on the environment 7
1.5 Further afield 14
References 17

## 2 Mixed farming

2.1 Introduction 19
2.2 Conventional cereal crop production 20
2.3 Life cycle 21
2.4 Crop establishment 21
2.5 Nutrient requirements 23
2.6 Disease and pest control 26
2.7 Weed control 28
2.8 Harvest and crop quality criteria 29
2.9 Organic agriculture 30
2.10 Organic conversion 30
2.11 Soil fertility and crop rotations 31
2.12 Summary 33
   Case Study 2.1: Down Farm 34
   Species Box 2.1: Cirl Bunting (*Emberiza cirlus*) 38
   Species Box 2.2: Skylark (*Alauda arvensis*) 44
   Species Box 2.3: Corn Marigold (*Chrysanthemum segetum*) 47
CONTENTS

2.13 Arable Flora 48
Species Box 2.4: Night-Flowering Catchfly (*Silene noctiflora*) and Small-Flowered Catchfly (*Silene gallica*) 49
2.14 Elveden estate 51
Species Box 2.5: Stone Curlew (*Burhinus oedicnemus*) 52
Case Study 2.2: STEEP Programme in the Pacific North West 53
Case Study 2.3: Cholderton Estate 63
Case Study 2.4: Blueberry Hill Farm, Maryland, US 71
2.15 Chapter summary 73
References 74

3 Grasslands 77
3.1 Introduction 77
3.2 Cultivated grasslands for grazing domestic stock 78
3.3 Breed selection 79
3.4 Making more of native grasslands 99
Case Study 3.1: Prairies 100
Species Box 3.1: Prairie Chicken (*Tympanicus cupids*) 103
Species Box 3.2: Pronghorn (*Antilocapra americana*) 104
Case Study 3.2: Switchgrass (*Panicum virgatum*) 106
Species Box 3.3: Golden Plover (*Pluvialis apricaria*) 111
Species Box 3.4: Lapwing (*Vanellus vanellus*) – Also Known as the Peewit 112
Case Study 3.3: UK Uplands 113
Species Box 3.5: Bee Orchid (*Ophrys apifera*) 126
3.5 Grassland ecosystems around the world 126
3.6 Temperate grasslands 128
Case Study 3.4: Sheltering Rock-Tuckaway Farm 129
Species Box 3.6: Plains Wanderer (*Pedionomus torquatus*) 135
References 138

4 Forestry and conservation 141
4.1 Introduction 141
4.2 Forest management 144
4.3 Forest management techniques: the UK model 145
4.4 Coppice 146
4.5 Coppice and wildlife 148
4.6 Wood pasture 153
4.7 Commercial forestry 154
4.8 High forest 155
4.9 Planting 155
INTRODUCTION TO WILDLIFE CONSERVATION IN FARMING

4.10 Harvesting 156
4.11 Sustainable forest management 158
  Case Study 4.1: Sunart Oakwoods Initiative 159
  Species Box 4.1: Red Squirrel (Sciurus vulgaris) 179
  Case Study 4.2: Longleaf Pine 180
  Species Box 4.2: Long Leaf Pine (Pinus palustris) 185
  Species Box 4.3: Red Cockaded Woodpecker (Picoides borealis) 189
  Species Box 4.4: Fox Squirrel (Sciurus niger) 192
  Case Study 4.3: New Hampshire Woodlands 193
  Case Study 4.4: Malaysian Tropical Forests, Forestry Industry and Enrichment Planting 196
  Species Box 4.5: Dipterocarpaceae 197
  Species Box 4.6: Bornean Clouded Leopard (Neofelis diardi ssp. borneensis) 199
4.12 Summary 215
References 215

5 Farming and the aquatic environment 219
  5.1 Water 219
  5.2 Water framework directive 219
  5.3 Part 1: On farm ponds, watercourses and riparian strips 220
    Species Box 5.1: Curlew (Numenius arquata) 230
    Case Study 5.1: Kuenzler Farm Wetland Restoration Programme 231
    Species Box 5.2: Bob White Quail (Colinus virginianus) 232
    Species Box 5.3: Northern Cricket Frog (Acris crepitans) 233
  5.4 Part 2: Fens, marshes and wetlands 234
    Species Box 5.4: Large Copper Butterfly (Lycaena dispar) 236
    Species Box 5.5: European Bittern (Botaurus stellaris) 237
  5.5 Part 3: Estuaries, coastal and marine 238
    Species Box 5.6: Natterjack Toad (Epidalia calamita – Formally Bufo calamita) 239
  5.6 Part 4: Aquaculture/fish farming 240
    Case Study 5.2: Dragon Feeds Ltd 243
    Case Study 5.3: Loch Duart Ltd Scotland 246
    Case Study 5.4: Offshore Fisheries in New Hampshire, US 252
    References 259

6 The future of farming and its implications for conservation 261
  6.1 Introduction 261
  6.2 Industrial-scale farming and monocultures 261
  6.3 Science and technology 263
  6.4 Precision farming 263
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5 Biotechnology</td>
<td>264</td>
</tr>
<tr>
<td>6.6 Tissue culture</td>
<td>268</td>
</tr>
<tr>
<td>6.7 Implications of reduced crop and stock diversity</td>
<td>269</td>
</tr>
<tr>
<td>6.8 Subsistence farming and emerging economies</td>
<td>270</td>
</tr>
<tr>
<td>6.9 Sustainable use of water, energy and waste</td>
<td>271</td>
</tr>
<tr>
<td>6.10 Agri-environment schemes</td>
<td>274</td>
</tr>
<tr>
<td>6.11 Conclusion</td>
<td>276</td>
</tr>
<tr>
<td>References</td>
<td>276</td>
</tr>
<tr>
<td><strong>Acronym list</strong></td>
<td>279</td>
</tr>
<tr>
<td><strong>Species tables</strong></td>
<td>283</td>
</tr>
<tr>
<td><strong>Glossary</strong></td>
<td>293</td>
</tr>
<tr>
<td><strong>Index</strong></td>
<td>297</td>
</tr>
</tbody>
</table>