

Status Survey and Conservation Action Plan 1995–1999

Partridges, Quails, Francolins, Snowcocks and Guineafowl

Compiled by
Philip J.K. McGowan, Simon D. Dowell, John P. Carroll and
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and the
WPA/BirdLife/SSC Partridge, Quail and Francolin Specialist Group



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Table of contents

Contents	i
Foreword	iv
Acknowledgements	v
Executive summary	vi
CHAPTER 1: Introduction	1
1.1: Species included in this Action Plan	1
1.1.1: Taxonomy	2
1.1.2: Species distribution and diversity	2
1.1.3: Economic importance and sustainable use	2
1.2: The Action Plan	3
1.2.1: Aims	3
1.2.2: Layout	3
1.2.3: Conservation Assessment Workshop	3
1.3: Threats to the survival of partridges, quails, francolins, snowcocks and guineafowl	4
1.3.1: Habitat loss in all its forms and fragmentation	4
1.3.2: Over-exploitation (for food, sport and the bird trade)	6
1.3.3: Hybridisation with released stock	6
1.3.4: Pesticides destroying food supply	6
1.3.5: Other threats	7
1.3.6: No threat	7
1.3.7: Insufficient information	7
1.4: Action needed to secure the future of partridges, quails, francolins, snowcocks and guineafowl	7
1.4.1: Research	8
1.4.2: <i>In situ</i> management	9
1.4.3: Other activities	10
CHAPTER 2: Summary of conservation assessment	13
2.1: Mace-Lande threat categories	12
2.2: The Conservation Assessment Table	15
CHAPTER 3: Threatened taxon summaries	24
3.1: Americas	26
3.1.1: Bearded tree-quail <i>Dendrortyx barbatus</i>	26
3.1.2: Black-eared wood-quail <i>Odontophorus melanotis</i>	26
3.1.3: Black-fronted wood-quail <i>Odontophorus atrifrons</i>	26
3.1.4: Chestnut wood-quail <i>Odontophorus hyperythrus</i>	27
3.1.5: Dark-backed wood-quail <i>Odontophorus melanonotus</i>	27
3.1.6: Tacarcuna wood-quail <i>Odontophorus dialeucos</i>	28
3.1.7: Gorgeted wood-quail <i>Odontophorus strophium</i>	28
3.1.8: Venezuelan wood-quail <i>Odontophorus columbianus</i>	28
3.1.9: Black-breasted wood-quail <i>Odontophorus leucolaemus</i>	29
3.1.10: Stripe-faced wood-quail <i>Odontophorus balliviani</i>	29
3.1.11: Ocellated quail <i>Cyrtonyx ocellatus</i>	29

3.2:	Africa	30
3.2.1:	Schlegel's banded francolin <i>Francolinus schlegelii</i>	30
3.2.2:	Grey-striped francolin <i>Francolinus griseostriatus</i>	30
3.2.3:	Nahan's forest francolin <i>Francolinus nahani</i>	30
3.2.4:	Double-spurred francolin (Moroccan subspecies) <i>Francolinus bicalcaratus ayesha</i>	31
3.2.5:	Cameroon Mountain francolin <i>Francolinus camerunensis</i>	31
3.2.6:	Swierstra's francolin <i>Francolinus swierstrai</i>	32
3.2.7:	Djibouti francolin <i>Francolinus ochropectus</i>	32
3.2.8:	Madagascar partridge <i>Margaroperdix madagarensis</i>	33
3.2.9:	Udzungwa forest partridge <i>Xenoperdix udzungwensis</i>	33
3.2.10:	White-breasted guineafowl <i>Agelastes meleagrides</i>	34
3.2.11:	Helmeted guineafowl (Moroccan subspecies) <i>Numida meleagris sabyi</i>	35
3.3:	Europe and the Middle East	35
3.3.1:	See-see partridge <i>Ammoperdix griseogularis</i>	35
3.3.2:	Caspian Snowcock <i>Tetraogallus caspius</i>	35
3.4:	South Asia	36
3.4.1:	Painted francolin (Sri Lankan subspecies) <i>Francolinus pictus watsoni</i>	36
3.4.2:	Swamp francolin <i>Francolinus gularis</i>	36
3.4.3:	Manipur bush-quail <i>Perdica manipurensis</i>	37
3.4.4:	Red-breasted hill-partridge <i>Arborophila mandellii</i>	37
3.4.5:	Ceylon spurfowl <i>Galloperdix bicalcarata</i>	37
3.4.6:	Indian mountain quail <i>Ophrysia superciliosa</i>	38
3.5:	China including Taiwan	38
3.5.1:	Verreaux's monal-partridge <i>Tetraophasis obscurus</i>	38
3.5.2:	Szechenyi's monal-partridge <i>Tetraophasis szechenyii</i>	38
3.5.3:	White-throated (Taiwan) hill-partridge <i>Arborophila crudigularis</i>	39
3.5.4:	Sichuan hill-partridge <i>Arborophila rufipectus</i>	39
3.5.5:	Collared hill-partridge <i>Arborophila gingica</i>	39
3.5.6:	White-eared (Hainan) hill partridge <i>Arborophila ardens</i>	40
3.6:	South-east Asia	40
3.6.1:	Long-billed wood-partridge <i>Rhizothera longirostris</i>	40
3.6.2:	Black wood-partridge <i>Melanoperdix nigra</i>	41
3.6.3:	Brown-breasted hill-partridge (north and south Vietnamese subspecies) <i>Arborophila brunneopectus henrici and albigula</i>	42
3.6.4:	Bare-throated hill-partridge (Javan subspecies) <i>Arborophila orientalis orientalis</i>	42
3.6.5:	Bare-throated hill partridge (Malaysian, NW Sumatran and C Sumatran subspecies) <i>Arborophila orientalis campbelli/rolli/sumatrana</i>	42
3.6.6:	Javan hill-partridge <i>Arborophila javanica</i>	43
3.6.7:	Orange-necked hill-partridge <i>Arborophila davidi</i>	43
3.6.8:	Chestnut-headed hill-partridge (Cambodian subspecies) <i>Arborophila cambodiana cambodiana</i>	44
3.6.9:	Chestnut-headed hill-partridge (Thai subspecies) <i>Arborophila cambodiana diversa</i>	44
3.6.10:	Red-billed hill-partridge <i>Arborophila rubrirostris</i>	45
3.6.11:	Borneo hill-partridge <i>Arborophila hyperythra</i>	45
3.6.12:	Annamese hill-partridge <i>Arborophila merlini</i>	46
3.6.13:	Scaly-breasted hill-partridge (Malay Peninsula subspecies) <i>Arborophila charltonii charltonii</i>	46
3.6.14:	Scaly-breasted hill-partridge (Sumatran subspecies) <i>Arborophila charltonii atjenensis</i>	47
3.6.15:	Scaly-breasted hill-partridge (Bornean subspecies) <i>Arborophila charltonii graydoni</i>	47
3.6.16:	Ferruginous wood-partridge <i>Caloperdix oculea</i>	48
3.6.17:	Crimson-headed wood-partridge <i>Haematortyx sanguiniceps</i>	48

3.6.18:	Crested wood-partridge <i>Rollulus rouloul</i>	49
3.6.19:	Mountain bamboo-partridge <i>Bambusicola fytchii</i>	49
CHAPTER 4: Five-year plan of action		51
4.1:	Core activities	54
4.1.1:	Increasing the coverage of the Specialist Group network	54
4.1.2:	Identification of key areas for the conservation of Asian Galliformes	55
4.2:	Americas	56
4.2.1:	Assessment of the conservation status of neotropical quails in northern Central America	56
4.2.2:	South American wood-quail <i>Odontophorus</i> monitoring and conservation plan	58
4.2.3:	Status and conservation of the bearded tree-quail <i>Dendrortyx barbatus</i> in Mexico	60
4.2.4:	Protection of a viable population of the gorgeted wood-quail <i>Odontophorus strophium</i> in Colombia	62
4.3:	Africa	64
4.3.1:	Survey of forest Galliformes in southern Uganda	64
4.3.2:	Conservation of the Djibouti francolin <i>Francolinus ochropectus</i> in Djibouti	66
4.3.3:	Survey of the habitat of the recently discovered Udzungwa forest partridge <i>Xenoperdix udzungwensis</i> in Tanzania	68
	Summaries of further projects in Africa	69
4.4:	Europe and the Middle East	71
4.4.1:	Survey of Caspian snowcock <i>Tetraogallus caspius</i> in Turkey, Armenia, Azerbaijan and Iran	71
4.5:	South Asia	73
4.5.1:	Survey and habitat management of the swamp francolin <i>Francolinus gularis</i> in India	73
4.5.2:	Survey of the endangered Manipur bush-quail <i>Perdica manipurensis</i> in North-east India	75
4.5.3:	Search for the Indian mountain quail <i>Ophrysia superciliosa</i> in the Indian Himalaya	77
4.6:	China including Taiwan	79
4.6.1:	Conservation of the Sichuan hill-partridge <i>Arborophila rufipectus</i> in China	79
4.6.2:	Conservation of the white-eared (Hainan) hill-partridge <i>Arborophila ardens</i> in Hainan, China	81
	Summaries of further projects in China including Taiwan	83
4.7:	South-east Asia	84
4.7.1:	Establishing conservation priorities for Galliformes on Sumatra, Indonesia	84
4.7.2:	Assessing conservation priorities for Galliformes on Borneo	87
4.7.3:	Survey of the re-discovered orange-necked hill-partridge <i>Arborophila davidi</i> in Vietnam	91
4.7.4:	Conservation of the threatened Galliformes in the Annamese lowlands of Vietnam	93
	Summary of further project in South-east Asia	95
References		95
Appendix 1. List of Partridge, Quail and Francolin Specialist Group members		100

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Status Survey and Conservation Action Plan 1995-1999 Partridges, Quails, Francolins, Snowcocks and Guineafowl was made possible through the generous support of:

BirdLife International
British Airways Assisting Conservation
Chicago Zoological Society
Deja Inc
National Wildlife Federation
Peter Scott IUCN/SSC Action Plan Fund (Sultanate of Oman)
Royal Zoological Society of Antwerp
Whitley Animal Protection Trust
World Pheasant Association
World Wide Fund for Nature

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ISBN 2-8317-0269-0

Published by IUCN, Gland, Switzerland

Camera-ready copy by the World Pheasant Association, Reading, UK.

Cover illustration: Sichuan hill-partridge by David Mead

Table of contents

Contents	i
Foreword	iv
Acknowledgements	v
Executive summary	vi
 CHAPTER 1: Introduction	 1
1.1: Species included in this Action Plan	1
1.1.1: Taxonomy	2
1.1.2: Species distribution and diversity	2
1.1.3: Economic importance and sustainable use	2
1.2: The Action Plan	3
1.2.1: Aims	3
1.2.2: Layout	3
1.2.3: Conservation Assessment Workshop	3
1.3: Threats to the survival of partridges, quails, francolins, snowcocks and guineafowl	4
1.3.1: Habitat loss in all its forms and fragmentation	4
1.3.2: Over-exploitation (for food, sport and the bird trade)	6
1.3.3: Hybridisation with released stock	6
1.3.4: Pesticides destroying food supply	6
1.3.5: Other threats	7
1.3.6: No threat	7
1.3.7: Insufficient information	7
1.4: Action needed to secure the future of partridges, quails, francolins, snowcocks and guineafowl	7
1.4.1: Research	8
1.4.2: <i>In situ</i> management	9
1.4.3: Other activities	10
 CHAPTER 2: Summary of conservation assessment	 13
2.1: Mace-Lande threat categories	12
2.2: The Conservation Assessment Table	15
 CHAPTER 3: Threatened taxon summaries	 24
3.1: Americas	26
3.1.1: Bearded tree-quail <i>Dendrortyx barbatus</i>	26
3.1.2: Black-eared wood-quail <i>Odontophorus melanotis</i>	26
3.1.3: Black-fronted wood-quail <i>Odontophorus atrifrons</i>	26
3.1.4: Chestnut wood-quail <i>Odontophorus hyperythrus</i>	27
3.1.5: Dark-backed wood-quail <i>Odontophorus melanonotus</i>	27
3.1.6: Tacarcuna wood-quail <i>Odontophorus dialeucos</i>	28
3.1.7: Gorgeted wood-quail <i>Odontophorus strophium</i>	28
3.1.8: Venezuelan wood-quail <i>Odontophorus columbianus</i>	28
3.1.9: Black-breasted wood-quail <i>Odontophorus leucolaemus</i>	29
3.1.10: Stripe-faced wood-quail <i>Odontophorus balliviani</i>	29
3.1.11: Ocellated quail <i>Cyrtonyx ocellatus</i>	29

3.2:	Africa	30
3.2.1:	Schlegel's banded francolin <i>Francolinus schlegelii</i>	30
3.2.2:	Grey-striped francolin <i>Francolinus griseostriatus</i>	30
3.2.3:	Nahan's forest francolin <i>Francolinus nahani</i>	30
3.2.4:	Double-spurred francolin (Moroccan subspecies) <i>Francolinus bicalcaratus ayesha</i>	31
3.2.5:	Cameroon Mountain francolin <i>Francolinus camerunensis</i>	31
3.2.6:	Swierstra's francolin <i>Francolinus swierstrai</i>	32
3.2.7:	Djibouti francolin <i>Francolinus ochropectus</i>	32
3.2.8:	Madagascar partridge <i>Margaroperdix madagarensis</i>	33
3.2.9:	Udzungwa forest partridge <i>Xenoperdix udzungwensis</i>	33
3.2.10:	White-breasted guineafowl <i>Agelastes meleagrides</i>	34
3.2.11:	Helmeted guineafowl (Moroccan subspecies) <i>Numida meleagris sabyi</i>	35
3.3:	Europe and the Middle East	35
3.3.1:	See-see partridge <i>Ammoperdix griseogularis</i>	35
3.3.2:	Caspian Snowcock <i>Tetraogallus caspius</i>	35
3.4:	South Asia	36
3.4.1:	Painted francolin (Sri Lankan subspecies) <i>Francolinus pictus watsoni</i>	36
3.4.2:	Swamp francolin <i>Francolinus gularis</i>	36
3.4.3:	Manipur bush-quail <i>Perdica manipurensis</i>	37
3.4.4:	Red-breasted hill-partridge <i>Arborophila mandellii</i>	37
3.4.5:	Ceylon spurfowl <i>Galloperdix bicalcarata</i>	37
3.4.6:	Indian mountain quail <i>Ophrysia superciliosa</i>	38
3.5:	China including Taiwan	38
3.5.1:	Verreaux's monal-partridge <i>Tetraophasis obscurus</i>	38
3.5.2:	Szechenyi's monal-partridge <i>Tetraophasis szechenyii</i>	38
3.5.3:	White-throated (Taiwan) hill-partridge <i>Arborophila crudigularis</i>	39
3.5.4:	Sichuan hill-partridge <i>Arborophila rufipectus</i>	39
3.5.5:	Collared hill-partridge <i>Arborophila gingica</i>	39
3.5.6:	White-eared (Hainan) hill partridge <i>Arborophila ardens</i>	40
3.6:	South-east Asia	40
3.6.1:	Long-billed wood-partridge <i>Rhizothera longirostris</i>	40
3.6.2:	Black wood-partridge <i>Melanoperdix nigra</i>	41
3.6.3:	Brown-breasted hill-partridge (north and south Vietnamese subspecies) <i>Arborophila brunneopectus henrici and albigula</i>	42
3.6.4:	Bare-throated hill-partridge (Javan subspecies) <i>Arborophila orientalis orientalis</i>	42
3.6.5:	Bare-throated hill partridge (Malaysian, NW Sumatran and C Sumatran subspecies) <i>Arborophila orientalis campbelli/rolli/sumatrana</i>	42
3.6.6:	Javan hill-partridge <i>Arborophila javanica</i>	43
3.6.7:	Orange-necked hill-partridge <i>Arborophila davidi</i>	43
3.6.8:	Chestnut-headed hill-partridge (Cambodian subspecies) <i>Arborophila cambodiana cambodiana</i>	44
3.6.9:	Chestnut-headed hill-partridge (Thai subspecies) <i>Arborophila cambodiana diversa</i>	44
3.6.10:	Red-billed hill-partridge <i>Arborophila rubrirostris</i>	45
3.6.11:	Borneo hill-partridge <i>Arborophila hyperythra</i>	45
3.6.12:	Annamese hill-partridge <i>Arborophila merlini</i>	46
3.6.13:	Scaly-breasted hill-partridge (Malay Peninsula subspecies) <i>Arborophila charltonii charltonii</i>	46
3.6.14:	Scaly-breasted hill-partridge (Sumatran subspecies) <i>Arborophila charltonii atjenensis</i>	47
3.6.15:	Scaly-breasted hill-partridge (Bornean subspecies) <i>Arborophila charltonii graydoni</i>	47
3.6.16:	Ferruginous wood-partridge <i>Caloperdix oculatea</i>	48
3.6.17:	Crimson-headed wood-partridge <i>Haematortyx sanguiniceps</i>	48

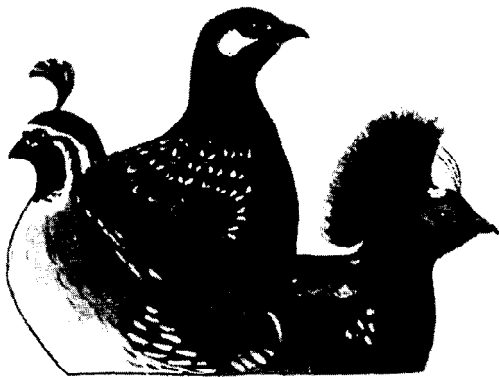
3.6.18:	Crested wood-partridge <i>Rollulus rouloul</i>	49
3.6.19:	Mountain bamboo-partridge <i>Bambusicola fytchii</i>	49
CHAPTER 4: Five-year plan of action		51
4.1:	Core activities	54
4.1.1:	Increasing the coverage of the Specialist Group network	54
4.1.2:	Identification of key areas for the conservation of Asian Galliformes	55
4.2:	Americas	56
4.2.1:	Assessment of the conservation status of neotropical quails in northern Central America	56
4.2.2:	South American wood-quail <i>Odontophorus</i> monitoring and conservation plan	58
4.2.3:	Status and conservation of the bearded tree-quail <i>Dendrortyx barbatus</i> in Mexico	60
4.2.4:	Protection of a viable population of the gorgeted wood-quail <i>Odontophorus strophium</i> in Colombia	62
4.3:	Africa	64
4.3.1:	Survey of forest Galliformes in southern Uganda	64
4.3.2:	Conservation of the Djibouti francolin <i>Francolinus ochropectus</i> in Djibouti	66
4.3.3:	Survey of the habitat of the recently discovered Udzungwa forest partridge <i>Xenoperdix udzungwensis</i> in Tanzania	68
	Summaries of further projects in Africa	69
4.4:	Europe and the Middle East	71
4.4.1:	Survey of Caspian snowcock <i>Tetraogallus caspius</i> in Turkey, Armenia, Azerbaijan and Iran	71
4.5:	South Asia	73
4.5.1:	Survey and habitat management of the swamp francolin <i>Francolinus gularis</i> in India	73
4.5.2:	Survey of the endangered Manipur bush-quail <i>Perdica manipurensis</i> in North-east India	75
4.5.3:	Search for the Indian mountain quail <i>Ophrysia superciliosa</i> in the Indian Himalaya	77
4.6:	China including Taiwan	79
4.6.1:	Conservation of the Sichuan hill-partridge <i>Arborophila rufipectus</i> in China	79
4.6.2:	Conservation of the white-eared (Hainan) hill-partridge <i>Arborophila ardens</i> in Hainan, China	81
	Summaries of further projects in China including Taiwan	83
4.7:	South-east Asia	84
4.7.1:	Establishing conservation priorities for Galliformes on Sumatra, Indonesia	84
4.7.2:	Assessing conservation priorities for Galliformes on Borneo	87
4.7.3:	Survey of the re-discovered orange-necked hill-partridge <i>Arborophila davidi</i> in Vietnam	91
4.7.4:	Conservation of the threatened Galliformes in the Annamese lowlands of Vietnam	93
	Summary of further project in South-east Asia	95
References		95
Appendix 1. List of Partridge, Quail and Francolin Specialist Group members		100

Foreword

There has long been an interest in galliform conservation as many of the birds in this order are attractive and popular with the general public. The World Pheasant Association (WPA), founded in 1975, is at the forefront of this work and has supported a number of successful projects. The most popular and conspicuous Galliformes are the pheasants, and inevitably WPA's earlier work concentrated on this group. In September 1991, an attempt was made to draw attention to the smaller species when the Game Conservancy jointly with WPA hosted the First International Symposium on partridges, quails and francolins at their headquarters in Fordingbridge, England. This symposium culminated in a decision to form a Specialist Group, affiliated to the Species Survival Commission of the World Conservation Union, The International Council for Bird Preservation (now BirdLife International) and WPA to deal with the smaller galliform species. It is the work of this group that has

produced this Action Plan. The Partridge, Quail and Francolin Specialist Group (hereafter referred to as the PQF Specialist Group) was initially made up of symposium delegates (more than 80). The group always welcomes new members and is open to anyone with a professional or amateur interest in the conservation biology of the smaller Galliformes. The PQF group has a core committee of twelve members, based in the UK, who meet twice yearly to review progress and policy. There is also a wider committee of regional co-ordinators around the world (see appendix 1).

The aim of the PQF Specialist Group is to promote the conservation of the world's partridges, quails, francolins, snowcocks and guineafowl by a) providing a network of correspondents on matters concerning these species and b) co-ordinating research and other conservation measures relating to species of immediate concern. The biannual newsletter of the Specialist Group *PQF News* serves to facilitate the first of these aims and this Action Plan should provide the catalyst for the second. The Action Plan is therefore a working document, designed to provide the starting point for the development of specific conservation projects. It is aimed at researchers, funding agencies, policy makers, governments and conservation managers. It represents a five year plan of action for the period 1995-1999, after which the document will be reviewed.



Simon D. Dowell

Chairman

WPA/BirdLife/SSC Partridge, Quail and Francolin
Specialist Group

Acknowledgements

This Action Plan is based on information contributed by many members of the Partridge, Quail and Francolin Specialist Group and others interested in their conservation. It is based upon a Conservation Assessment Workshop held in Antwerp during 1993 and jointly organised by the World Pheasant Association (WPA), the Captive Breeding Specialist Group of the Species Survival Commission and BirdLife International. The workshop was generously sponsored by Koninklijke Maatschappij voor Dierkunde van Antwerpen V.Z.W. (Royal Zoological Society of Antwerp), and British Airways-Assisting Nature Conservation flew key participants from India, Indonesia, Uganda and the United States. We gladly acknowledge their support and especially that of Fred Daman in Antwerp, Rod Hall of British Airways-Assisting Nature Conservation, Keith Howman at WPA and Roland Wirth from BirdLife International.

As well as providing the information that was discussed in Antwerp, many of the correspondents have subsequently commented upon the report of that workshop and provided additional information. We are very grateful to the following, some of whom were present in Antwerp, for their support and for giving their time and expertise so generously: Eve Abe, Gary Allport, John Ash, Bas van Balen, A. Bernard-Laurent, Colin Bibby, Neil Burgess, Kevin Church, Tim Crowe, Geoffrey Davison, Edward Dickinson, Lars Dinesan, Jonathan Eames, Susie Ellis, Mike Evans, L Fishpool, Paulo Fontoura, Michael Gallagher, Gao Yu-ren, He Fen-qi, Bill Harvey, Derek Holmes, Carol Inskipp, Salim Javed, David Jenkins, Michael Jennings, Paul Jepson, Rahul Kaul, Martin Kelsey, Joris Komen, M. Lentino, Rob Little, Liu Naifa, Yuriy Lukianov, Akil Malik, J. Negret, Stephen Newton, Nadia de la Perche, Derek Pomeroy, Roald Potapov, Dick Potts, Ingo Rieger, Asad Rahmani, Ettore Randi, M.K. Ranjitsinh, Gary Robbins,

Tom Roberts, Craig Robson, Phil Round, K. Parkes, Charles Santiapillai, Ulysses S. Seal, Lucia Liu Severinghaus, Silvio Spano, Gary Stiles, Jens-Otto Svendsen, D. Teixeira, Christos Thomaides, Paul Thompson, Geoff and Hilary Welch, E. Willis, Roland Wirth, Zhang Zheng-wang, Zhao Zheng-jie.

The entire draft was critically reviewed by Karen Blake, David Mead, Dick Potts and Gary Robbins. Illustrations were generously provided by David Mead, Geoff and Hilary Welch, Timothy Greenwood, Martin Woodcock and Richard Robjert. Particular thanks are due to Christopher Helm (Publishers) Ltd for permission to reproduce as yet unpublished paintings by David Mead from their forthcoming publication *Pheasants, Partridges and Grouse*. We would also like to acknowledge the Oxford University Press for permission to use paintings by Henry Jones and Timothy Greenwood published in *The Quails, Partridges and Francolins of the World* by Paul A Johnsgard and Rosie Trevelyan of the Tropical Biology Association for use of their slides. The maps were prepared by Karen Blake, Simon Dowell and Tom Gardiner. Typesetting was done by Jane Clacey and further help on layout was given by Tom Gardiner, David Mead and Keith Howman.

The data from the WPA-International captive census show that there are many birds not registered with ISIS. We appreciate the co-operation of those private breeders who returned census figures.

We would like to thank the World Pheasant Association for providing the financial support necessary for the preparation of this Action Plan, and the Biology Department of The Open University, the School of Biological and Earth Sciences at Liverpool John Moores University and the Research Department at The Game Conservancy Trust for the use of their facilities.

Executive Summary

This Action Plan covers the world's partridges, quails, francolins, snowcocks and guineafowl, a group of birds from the order Galliformes comprising 141 species according to the most recent taxonomic consideration (Sibley & Monroe 1990), plus one further species newly discovered in 1991 (Dinesen *et al.* 1994). These birds attract considerable interest throughout the world on account of their importance in ornamental collections, as food sources, as sporting quarry, as indicators of the health of ecosystems and as objects of great beauty. The objectives of this document are to identify the most threatened species and sub-species within this group (chapters 2 & 3) and prioritise the conservation action required to protect them by outlining project briefs for the most urgent cases (chapter 4).

The plan of action will be distributed to biologists, conservationists, captive breeding specialists, politicians, policy makers, government officials, educationalists, planners, grant-awarding bodies and commercial concerns that are in a position to help. Partridges, quails, francolins, snowcocks and guineafowl have a world-wide distribution and are absent only from the polar and cold temperate regions. The greatest threats to their continued existence occur in the sub-tropical and tropical regions where deforestation, overpopulation, wetland drainage and overgrazing are most acute. These problems are often immense and in many cases will require national and international efforts to resolve them. Much can be done at the local level, however, and the projects in chapter 4 should be considered by those with local influence in the areas concerned as well as by national officials and politicians. The full co-operation and involvement of local people is essential if any of these projects are to be successful.

Chapter 1 gives an overview of the species involved, threats to them and possible courses of action to protect them. Whilst intended as a general introduction, it will be particularly useful to readers who are unfamiliar with the group. Chapter 2 summarises the conservation status of all partridges, quails, francolins, snowcocks and guineafowl.

The species identified as threatened are examined more thoroughly in chapter 3, which is divided into regional sections for easy reference: countries/regions that are especially highlighted include Central and South America, East Africa, India, China, Indonesia and Vietnam. Each species account contains detailed information on known distribution and current threats. Chapters 2 and 3 are written largely with biologists and professional conservationists in mind, i.e. those people who will be carrying out the scientific work proposed in the project plans of chapter 4.

Chapter 4 contains the project proposals that are targeted at the species most in need of conservation action. Like chapter 3, it is divided into regional sections. Each project plan justifies the project from a conservation and scientific stand-point. The information on time scale and projected budgetary requirements will enable potential sponsors, grant awarding bodies and policy makers to assess the feasibility of their involvement. Field biologists who are likely to carry out the work are advised to use these project plans in direct consultation with policy makers, government officials and grant awarding bodies when developing these projects further. Governments and politicians can use these project ideas to consider plans for high-profile conservation initiatives, either alone, or in conjunction with other conservation projects in the same regions. A number of the projects have the potential for research student involvement, particularly with survey work and the gathering of baseline data on population biology, so universities in the countries concerned should peruse chapter 4 for research ideas.

Whilst we will endeavour to distribute this Action Plan to all who we think might further its objectives, we are sure that those reading it will know of others who could make use of it, so we urge readers to bring this publication to the attention of any such people. The Partridge, Quail and Francolin Specialist Group will do its best to stimulate the follow-up of this Action Plan and will be pleased to advise on its implementation. We look forward very much to its success.

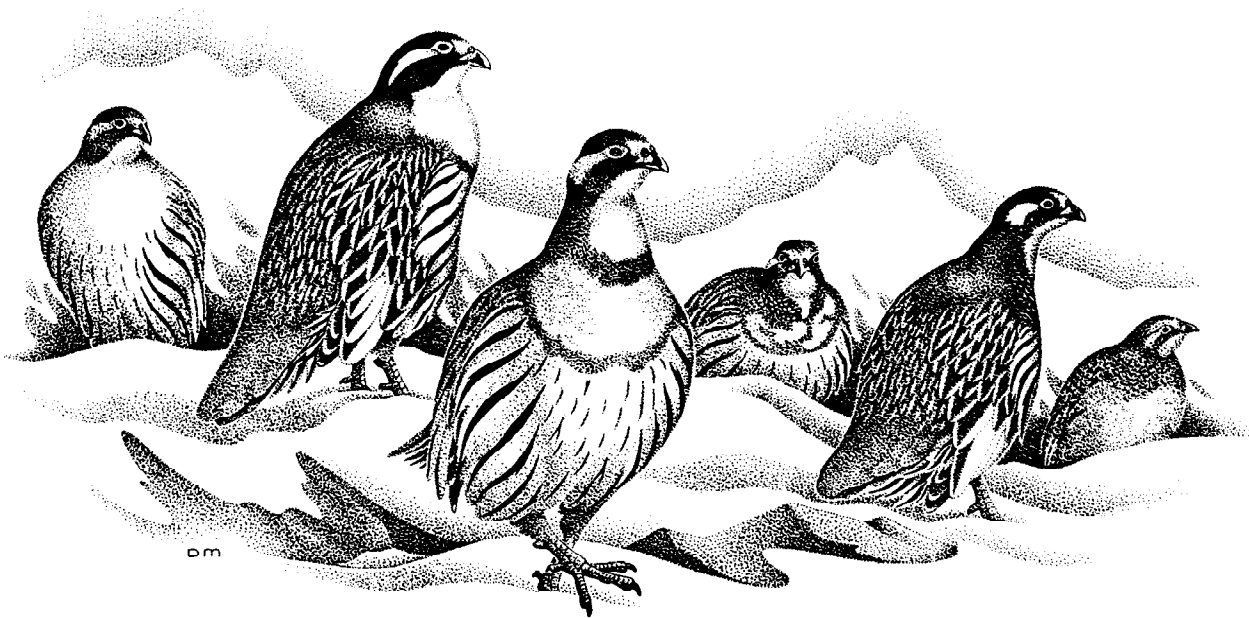
1. Introduction

This Action Plan is a prescription for the most urgent conservation action needed for the world's threatened partridges, quails, francolins, snowcocks and guineafowl, based on the currently available knowledge of the conservation status of each species. The plan is not a comprehensive account of the biology of the species concerned (this has been published elsewhere, e.g. Johnsgard 1988) but it does provide the most up-to-date assessment of distribution and status of the smaller galliforms and, more importantly, it explains the work that needs to be done to ensure the survival of the most threatened species. Every effort has been made to gather this knowledge from published and unpublished material, correspondence and verbal communication with all those involved in research and conservation of these birds. The document represents eighteen months of gathering information, organising it and consulting the specialists from whom it came. This process included a Conservation Assessment Workshop where 25 experts were gathered to assess the conservation status of the species involved and establish priorities for their conservation. This process is described in full in Section 1.2.3.

1.1. Species included in this Action Plan

This Action Plan covers the partridges, quails, francolins, snowcocks and guineafowl of the world. They do not comprise a family of their own, but have been classified variously as part of one family (Crowe *et al.* 1986), all of one family and part of another (Peters 1934), or all of two families and present in a third (Sibley and Monroe 1990), all within the Galliformes. Nevertheless, the group is easily recognisable and is discrete within the order Galliformes. There are 102 (Johnsgard 1988) or 104 (Sibley and Monroe 1990) species of Old World partridges, quails, francolins and snowcocks, 31 species of New World quail and 6 species of guineafowl (Johnsgard 1988; Sibley and Monroe 1990). The full list of the species and subspecies considered in this Action Plan is given in Chapter 2.

For a full discussion of the classification of the higher taxonomic levels of the Galliformes, including a historical review and discussion of DNA-DNA evidence, see Sibley and Ahlquist (1990; especially pages 289-300) and Johnsgard (1988).



Tibetan Snowcock

Artist: David Mead

Information on natural history, ecology and behaviour can be found in Johnsgard's (1988) monograph, Birkan *et al.* (1992), Potts (1986) and Hudson and Rands (1988) as well as key regional references such as Crowe *et al.* (1986), Cramp and Simmons (1980), Ali and Ripley (1983) and Blake (1977). There is also a multitude of national and other avifaunal accounts which include information on the smaller galliforms, including Smythies (1981; 1986), Inskipp and Inskipp (1991), van Marle and Voous (1988) and Lekagul and Round (1991).

1.1.1. Taxonomy

Peters (1934) and Johnsgard (1988) considered that the partridge, quail, francolin and snowcock species belong to two subfamilies of the Phasianidae: the New World quails within the Odontophorinae, and the Old World species, within the subfamily Phasianinae, which also includes the pheasants. Recently, however, it has been suggested that the New World quails be considered as a separate family, the Odontophoridae (Sibley and Monroe 1990). Whilst the guineafowl have been regarded as a distinct group of species, they have been assigned variously to a family of their own, the Numididae (Peters 1934; Sibley and Monroe 1990), and a subfamily, the Numidinae, within the Phasianidae (Johnsgard 1973; Crowe *et al.* 1986).

The species-level taxonomy used in this Action Plan follows Sibley and Monroe (1990), except for the sequence of African species, especially *Francolinus*, which follows Crowe *et al.* (1986). The sequence of species in the latter account is largely consistent with the grouping of species in the recently proposed revision of *Francolinus* (Crowe *et al.* 1992). This revision proposes splitting the genus into four genera and whilst we have decided to be conservative in this Action Plan, we request comments on the validity and utility of the revised taxonomy.

1.1.2. Species distribution and diversity

There are currently 141 species (Sibley and Monroe 1990) of partridges, quails, francolins, snowcocks and guineafowl, although there is some dispute over the specific status of some of the members of the genera *Coturnix*, *Arborophila* and *Odontophorus* (see under Taxonomic clarification in Section 1.4.3). As recently as 1991, a new species of perdicine was discovered in Tanzania which seems to be closer morphologically to the *Arborophila* of Asia than to any of the African genera and has been placed in a new genus of its own, *Xenoperdix* (Dinesen *et al.* 1994).

The partridges, quails, francolins, snowcocks and guineafowl are an ecologically diverse group of gallinaceous birds with a world-wide distribution, excluding the polar regions. The New World quails are distributed from the United States through Central America to central South America; the Isthmus of Panama contains the highest density of genera. The Old World quails are distributed

widely throughout the Old World, except for Saharan Africa, extreme northern Europe, northern Siberia and the Australian interior. Many areas have two or more genera present. The north-east of the Indian sub-continent contains five genera, and various major land masses in south-east Asia are home to six or seven (Johnsgard 1988). The six guineafowl species occur only in Africa and Arabia (Crowe *et al.* 1986).

On account of their wide distribution across the globe, partridges and their allies can be found in virtually every terrestrial ecotype. Only tundra and boreal forest ecosystems lack representatives from the group. They occur in open-country and closed forest habitats. Open habitats in which these species are found include tropical open country (e.g. the grey-breasted francolin *Francolinus rufopictus* from East Africa), deserts (e.g. the Philby's rock partridge *Alectoris philbyi* of western Arabia), temperate open country (e.g. the grey partridge *Perdix perdix* of Europe and northern Asia) and high altitude alpine zones (e.g. the Tibetan snowcock *Tetraogallus tibetanus* from the Pamir and Himalayan Ranges). They are found in forested habitats such as lowland tropical rain forest (e.g. the crested wood-partridge *Rollulus rouloul* of south-east Asia and the white-breasted guineafowl *Agelastes meleagrides* of West Africa), montane tropical forest (e.g. the red-billed hill-partridge *Arborophila rubrirostris* from Sumatra, Indonesia and the bearded tree-quail *Dendrortyx barbatus* from eastern Mexico) and subtropical forests (e.g. the Sichuan hill-partridge *Arborophila rufipectus* from south-western China).

Although not as conspicuous as their larger relatives the pheasants, a few of the partridge and quail species have enjoyed a high profile as popular sporting/table birds, most notably the grey partridge *Perdix perdix* and red-legged partridge *Alectoris rufa* in Europe and the bobwhite quail *Colinus virginianus* in North America. These species have been the subject of a great deal of research, initially on account of their economic importance but more recently, because of marked declines across much of their ranges. The bobwhite quail alone has been the subject of over 3000 publications (Church and Taylor 1992). This has led to a good knowledge of the ecology and population dynamics of certain temperate species which can sometimes (but not always) be usefully applied to other, less well-known species. The well-studied temperate species act as 'barometers' of environmental change; their declines have often provided the first indication of the adverse effects of pesticide use and agricultural intensification (Potts 1986). The species from tropical areas are far less studied and in some cases there is virtually no information at all on status and biology.

1.1.3. Economic importance and sustainable use

Partridges, quails, francolins, snowcocks and guineafowl

have been exploited for food and for sport throughout recorded history. Nowadays, exploitation for food occurs mainly in developing countries (e.g. in Africa: Collar and Stuart 1985; Ash 1992; Pomeroy and Abe 1992; in Asia: Round 1988; van Balen 1992; Zhao *et al.* 1992), and the birds are killed for immediate consumption or for sale in local markets; the scale of the exploitation is poorly documented. In Europe and North America, by contrast, hunting is predominantly for sport (Potts 1986; Birkan *et al.* 1992), and data on bag numbers are sometimes excellent (see Tapper 1992).

Neither type of exploitation is necessarily detrimental to the species taken, so long as the use is sustainable. The main problem facing many galliforms subject to exploitation is that outside pressures such as forestry or agriculture degrade the habitat and reduce populations to the point that traditionally sustainable use becomes unsustainable. One solution is to ensure that the commercial value of the exploited gamebirds generates sufficient self-interest for the hunter to care about the continued existence of the hunted stock in the long term (Aebischer 1991). In Britain, the grey partridge *Perdix perdix* is most abundant on estates where economic self-interest justifies appropriate environmental management; in areas where the vested interest is missing, so is the management and, often, so is the partridge (Potts 1986). The CAMPFIRE project in Zimbabwe illustrates how, given a guaranteed return in the form of meat and money to local communities from organised sport hunting, the local people look after the game animals and their habitats (Anon. 1990); an extension of the project to gamebirds is under study (Hartley and Mundy 1992). Sustainable harvesting of species which are currently being exploited in a non-sustainable way is being promoted by the Species Survival Commission's Specialist Group on the Sustainable Use of Wild Species, and could be relevant to some of the taxa covered by this Action Plan. Encouraging sustainable harvesting of species that are not currently used in this way in an effort to develop incentives for conservation is more controversial, but should not be ruled out of hand.

1.2. The Action Plan

1.2.1. Aims

This document aims to highlight the plight of threatened species and subspecies of partridges, quails, francolins, snowcocks and guineafowl. It offers ways of finding out more about them, with a view to promoting the survival of their habitats and of the species themselves.

The main purpose of this Action Plan is to give outlines of species conservation projects: urgent programmes requiring execution within the period 1995-1999, that involve taxonomic investigation, distributional surveys, intensive research, population monitoring, habitat management or education. Each project outline includes

details of technical and manpower requirements where known, and the estimated time scale and costs.

1.2.2. Layout

Three main sections summarise the steps that the PQF Specialist Group has taken to assess global conservation priorities. These steps are: i) to collate conservation data, assess extinction risks and assign threat categories (Chapter 2); ii) to provide information on threatened taxa (Chapter 3); and iii) to determine priority projects that are practical and can be initiated within the period 1995-1999 (Chapter 4). The focus for the development of this Action Plan was the Conservation Assessment Workshop on the Galliformes held in Antwerp during the first week of February 1993.

1.2.3. Conservation Assessment Workshop

Background

The Captive Breeding Specialist Group of IUCN's Species Survival Commission has run some 15 Conservation Assessment Workshops over the last few years, usually in collaboration with one or more of the other Specialist Groups.

The object of these meetings is first to review what is currently known about the status of, and threats to, all the distinct races (be they species or subspecies) of animals (or plants) in a particular taxonomic group. As a result of this review process, each race is then assigned a threat category, representing the risk of its future extinction. Finally, specific conservation action is recommended wherever necessary. Conservation Assessment Workshops on bird groups have recently covered penguins, parrots, pigeons and waterfowl.

The Galliformes Workshop

The species included in the Galliformes workshop were the responsibility of three of the five Galliformes Specialist Groups - those for Pheasants; Partridges, Quails, Francolins, Snowcocks and Guineafowl; and Megapodes.

The three Specialist Groups involved collected many of the data in advance of the workshop. Information on native range size, population size (in the wild and in captivity), population trends and perceived threats was sought for every species, and usually from all its range countries, by asking local experts to fill in a standard questionnaire. These were distributed in September/October 1992 to about 80 people, and 60 were returned by the end of January 1993.

The data from these questionnaire returns were entered into a table (as in Chapter 2). Provisional decisions about which subspecies, or subspecies clusters, would be considered as distinct taxa were also made at this stage, and each was given a separate row in the table. Island subspecies, and other geographically isolated races or parapatric clusters of them, were given distinct taxon status, subject to discussion at the Conservation Assessment

Workshop itself.

Discussions at the workshop were organised on a regional basis, with groups of participants concentrating on: S.E. Asia and Australasia; China and South Asia; Europe, the Middle East and Africa; and the Americas. A number of species occurred in 2 of these regions, and some even in 3: these were discussed jointly.

The main tasks undertaken during the workshop were to:

- (i) Compile information on known captive population sizes of each taxon from the 1992 WPA captive census and the 1992 ISIS records.
- (ii) Review the information in the table and assess its reliability, including the division of species into subspecies or subspecies groups of conservation merit.
- (iii) Amalgamate or subdivide information (e.g. on population size) supplied from different range countries for
- (iv) Assign a threat category on the basis of the Mace-Lande criteria (Mace and Lande 1991) to each taxon recognised in (ii).
- (v) Make recommendations for future action for all taxa judged to be threatened with extinction (i.e. insufficiently known vulnerable, endangered or critical), and for some others, especially where there is an evident need for taxonomic clarification of specific or subspecific status.
- (vi) Consolidate information for each threatened taxon into a "Threatened taxon summary".

These tasks resulted in two sets of output: the Conservation Assessment Table (Chapter 2) and the Threatened Taxon Summaries (Chapter 3). Following the workshop, copies of the table and Threatened Taxon Summaries were distributed for comment to WPA correspondents and members of the three Specialist Groups involved.

Based on all the information above, the PQF Specialist Group identified key projects for execution during the period 1995-1999. These projects are taxon-, habitat- or locality-specific. Whenever possible, they relate closely to the Conservation Strategy of WPA and the BirdLife International Conservation Programme, and in particular to its continuing work on the 221 Endemic Bird Areas identified through the Biodiversity Project, and its efforts to identify a global set of Important Bird Areas. Through detailed consultations with other Species Survival Commission Specialist Groups and their various parent bodies, regional field projects should emerge that address several urgent conservation cases simultaneously.

Projects have been identified according to three criteria: conservation urgency, logistic practicality and financial practicality. Some action is proposed for all seriously threatened taxa and feasibility of action has been used to determine project priorities. For example, species distributed throughout regions where civil strife shows no signs of ending have not been included.

Project outlines (given in Chapter 4) provide some of the information necessary for drafting detailed project

proposals. Such proposals should be acted upon in consultation with the Specialist Group which will help with project development wherever possible through its core committee, WPA and BirdLife International.

1.3. Threats to the survival of partridges, quails, francolins, snowcocks and guinea fowl

This section defines each of the threats given in the Conservation Assessment Table (Chapter 2), provides a summary of the scale of the threat to the group as a whole and gives specific examples to illustrate how the threat affects species of concern.

1.3.1. Habitat loss in all its forms and fragmentation

Habitat loss covers all forms of habitat structure modification that lead to a reduction in the extent or quality of habitat available for a particular species. This ranges from clear felling, through selective logging and habitat degradation to habitat loss to agriculture and urban development. These forms of habitat disturbance often grade into each other. For example, land cleared of trees as a consequence of timber extraction is often replanted with plantations of commercially valuable crops.

The majority of partridge, quail, francolin, snowcock and guinea fowl species are threatened by some form of habitat alteration. Chapter 2 indicates that 98 of the 151 taxa covered in this plan are known to be or suspected of suffering a decline in numbers due to some form of habitat modification.

Clear felling refers to the removal of all trees in an area, usually as a consequence of timber extraction by logging operations. This is especially prevalent in areas where tropical forest lies over level ground and commercially valuable trees are extracted on a large scale. The conversion of natural habitats to agricultural land is often bound up with clear-felling, such as when forest cover was cleared to make way for tobacco and rubber and then palm-oil plantations during this century in parts of Indonesia and Malaysia (Wells 1985).

Logging operations are the major cause of the decline in numbers of the crested wood-partridge *Rollulus rouloul*. McGowan (1992) indicated that this species, which was once widespread throughout the lowland rain forest of the Sunda sub-region in south-east Asia, has suffered a considerable range contraction in the second half of this century. Whilst the species still appears to be common in suitable habitat, the loss of undisturbed habitat in many parts of its former distribution has led to local extinctions in many areas. Indeed, its long-term survival may well depend on

protected areas in appropriate places (McGowan 1992), such as Taman Negara and the Krau Wildlife Reserve in Peninsular Malaysia.

Severe deforestation is threatening the bearded tree-quail *Dendrortyx barbatus* in Mexico (Howell & Webb 1992) and the gorgeted wood-quail *Odontophorus strophium* in Colombia (Collar *et al.* 1992). Even common and widely distributed species in Latin America, such as the spot-winged wood-quail *O. capuiera* are threatened by deforestation.

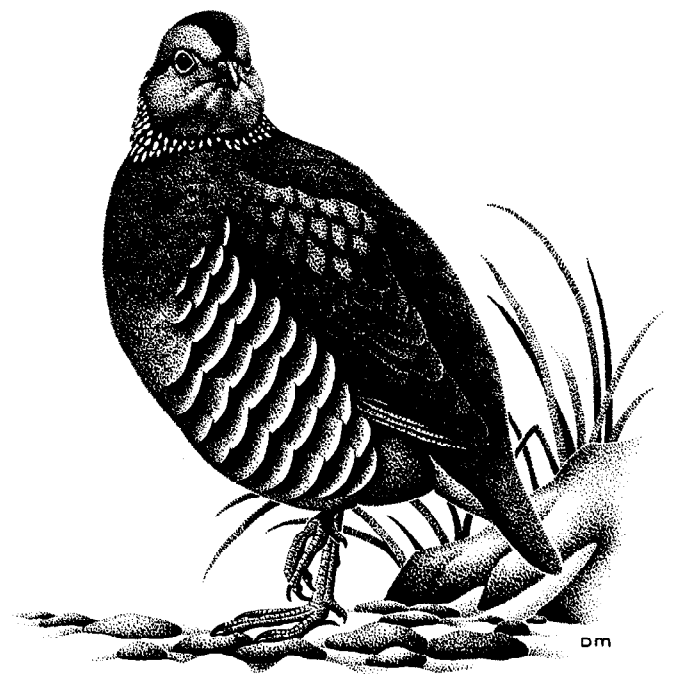
Habitat degradation is the reduction in quality of a habitat without losing all vegetation cover and results from activities such as selective logging, over-grazing by domestic animals and agricultural intensification.

Selective logging normally refers to timber extraction that removes only some of the trees in an area and on a sustainable basis. This can, however, range from removal of just a few trees per square kilometre to loss of all but a few trunks. The associated problems of damage to residual trunks, soil compaction *etc.* are discussed by Whitmore (1984). See also Johns (1989) and Marshall and Swaine (1992) for a fuller discussion of selective logging of tropical forest.

Whilst selective logging implies that trees are harvested according to sustainable principles and hence alterations to forest structure are as limited as possible, at its most extreme the forest simply becomes degraded as few trees are left undamaged and the canopy becomes much more broken and irregular.

Other forms of habitat degradation include loss of understorey through grazing by domestic animals, a widespread phenomenon in the Western Himalayan mid-altitude forests (Gaston *et al.* 1981) and on Indian grasslands (Kaul and Howman 1992), and alteration of the patchwork of vegetation seen in open country and agricultural habitats, such as loss of nesting cover available to the grey partridge in Europe due to agricultural intensification (Potts 1986). Indeed, agricultural intensification and/or overgrazing have been cited as threats to the populations of a number of other partridge, quail and francolin species which have adapted to survive in low-intensity agricultural environments, including the red-legged partridge *Alectoris rufa* (Rands 1985, 1986; Lucio and Purroy 1992), the Barbary partridge *A. barbara* (Wadsack 1992), the swamp francolin *Francolinus gularis* (Shrestha 1992), the Djibouti francolin *F. ochropectus* (Ash 1992; Welch and Welch *in litt.*) and the painted francolin *F. pictus* (Kaul and Howman 1992).

Habitat loss to agriculture affects species from both open and forested habitats. Several taxa are threatened specifically by habitat loss to agriculture. In North Africa, for example, the Barbary partridge is considered to be widespread in remote and protected areas, but elsewhere it is believed to have declined locally owing to hunting and loss of habitat to agriculture (Crowe *et al.* 1986). The continued clearance of forest throughout much of lowland Sumatra and Kalimantan in Indonesia is of considerable concern for



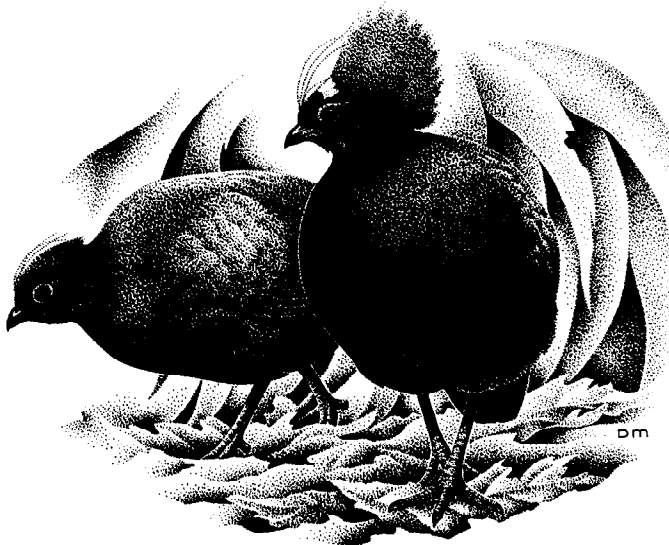
Barbary Partridge

Artist: David Mead

many lowland forest partridge species, especially those which appear to have specialised needs (van Balen 1992), such as the scaly-breasted hill-partridge *Arborophila charltonii* and the black wood-partridge *Melanoperdix nigra*. Indeed such intensive cultivation may have led to the extinction of lowland forest partridges on Java, from where no lowland species are now known and it is believed that only 2-4% of forest cover remains along the island's south coast.

Habitat loss to urban development comprises all forms of human construction, such as housing and roads. Only one species, the Chinese bamboo-partridge *Bambusicola thoracica* (He Fen-qi, *in litt.*), is considered to be threatened by habitat loss to urban development.

Combined pressures. The habitats of most species that are threatened with habitat loss are subject to a variety of pressures and both open and forested ecosystems are at risk. The swamp francolin *Francolinus gularis*, for example, is suffering from degradation of its wet grassland habitat through drainage and conversion of the margins around marshes to plantations, road-building through and around wet grasslands and the complete loss of some grassland patches (Carol Inskipp *in litt.*; Sàlim Javed *in litt.*; Asad Rahmani *in litt.*; Philip McGowan pers. obs.). In Peninsular Malaysia, lowland tropical rain forest is under pressure from clear-felling, degradation and loss of forest cover to agriculture (plantations) and to road and house-building programmes ("land development") (Salleh Mohd. Nor 1988). Indeed, Wells (1985) considered that the avifaunal crisis in the Sunda sub-region (tropical wet South-east Asia) was in the terrestrial lowlands where the scale of forest loss



Crested wood-partridge

Artist: David Mead

puts partridge species at risk, such as the vulnerable long-billed wood-partridge *Rhizothera longirostris*, black wood-partridge *Melanoperdix nigra* and crested wood-partridge *Rollulus rouloul* and the scaly-breasted hill-partridge *Arborophila charltonii*, different subspecies of which are endangered or critical.

Habitat fragmentation is the isolation of blocks of habitat. This can lead to populations of a species becoming demographically and genetically isolated from each other and, therefore, prone to other extinction pressures, such as inbreeding. The problem of population isolation resulting from fragmentation of habitat has received much theoretical study (e.g. Soule 1986), but has not been addressed experimentally for any vertebrate species, presumably due to the problems of monitoring populations over many generations. How some of the issues affect game birds has been outlined by Perrins (1992).

1.3.2. Over-exploitation (for food, sport and the bird trade)

Direct threats to species are secondary in comparison with threats to their habitats. Nonetheless, over-exploitation of wild populations is a considerable problem. Three Old World taxa are trapped for the bird trade on a scale which is considered to affect their numbers adversely, but no New World quails are considered threatened by this activity. Particularly worrying is the increasing threat to the vulnerable Javan endemic, the Javan hill-partridge *Arborophila javanica*. van Balen (1992) records that increasing numbers of this species are being reported from bird markets on Java in Indonesia.

Thirty Old World taxa are believed to be threatened by hunting. This is mostly over-exploitation for food, but also for sport in a few cases. Of the New World quails, 13 taxa

are probably suffering from over-hunting for food. This problem also faces the other tropical forest galliformes, the Cracidae (Strahl and Grajal 1991; Silva and Strahl 1991). Hunting is a problem in particular regions, rather than for particular species. For example, Ash (1992) states that there is relatively little hunting in the Horn of Africa (Ethiopia, Somalia and Djibouti) for religious reasons. Round (1988), however, states that most partridges, quails and pheasants are at risk because of over-hunting in Thailand and that this pressure now poses as large a threat to the survival of the Thai partridges as does habitat loss.

1.3.3. Hybridisation with released stock

The rearing in captivity and release of partridges to supplement wild stocks for shooting provides opportunities for inter- and intra-specific hybridisation with wild partridges. Usually areas experiencing such activity have suffered severe declines of their wild partridge stocks, often as a result of declines in sustainable management practices, necessitating the release of reared birds if hunting is to remain viable. Several studies have shown that survival of captive-reared partridges is extremely poor following release (Birkan 1971, Panek 1987, Dowell 1990).

Other problems arising from the release of captive-reared birds include poor breeding success (Rands and Hayward 1987; Potts 1989), increased hunting pressure and introduction of alien diseases (Robertson and Dowell 1990) and hybridisation of released alien species with local species, for example red-legged partridge *Alectoris rufa* hybridising with introduced chukar partridge *A. chukar* (Potts 1989).

1.3.4. Pesticides destroying food supply

Pesticides can act directly by their toxic effects on flora and fauna or indirectly by affecting a vital link in the food chain. As the chicks of most galliform species feed on insects, there is often less food for the chicks to eat in areas where pesticides are used than in those where they are not. Whilst pesticides do not alter the structure of the habitat (compare with section 1.3.1. above), such a lowering of habitat quality could be defined as a form of habitat degradation. The use of pesticides is one feature of agricultural intensification which is affecting many partridge, quail and francolin species in a variety of ways.

The development of the agrochemical industry and in particular the introduction of chemical pesticides has had a major effect on the wildlife of agricultural habitats. Because many partridge, quail and francolin species have adapted to living in agricultural environments, pesticide use has had severe side-effects. For some species, such as the grey partridge *Perdix perdix* and the bobwhite quail *Colinus virginianus*, the effects are well-established and documented (see, for example, Potts 1986 for the grey partridge and Roseberry and Klimstra 1984 for the bobwhite). Potts



Northern bobwhite

Artist: David Mead

(1986) suggested that there are three ways in which pesticides adversely affect partridge populations: direct ingestion or contact; build-up of sub-lethal doses; and ecological changes wrought by the pesticide. He considered the first two to be currently insignificant, but that the third was the cause of a high level of chick mortality.

Pesticides are considered a cause for concern for eight taxa and possibly a further two. These are: Przevalski's rock partridge *Alectoris magna*, grey francolin *Francolinus pondicerianus*, black francolin *F. francolinus*, grey partridge *Perdix perdix*, rain quail *Coturnix coromandelica*, Asian blue-quail *C. chinensis*, northern bobwhite *Colinus virginianus*, crested bobwhite *Colinus cristatus* and possibly swamp francolin *Francolinus gularis* and white-throated hill-partridge *Arborophila crudigularis*.

1.3.5. Other threats

There are two threats which are each considered important for one species. Granite mining is of concern for Hartlaub's francolin *Francolinus hartlaubi* (Joris Komen *in litt.*) and the possibility of volcanic eruption is considered a major potential threat to the Cameroon mountain francolin *F. camerunensis* (Collar and Stuart 1985; Crowe *et al.* 1986). The eruption of Mount Cameroon in 1982 resulted in the loss of a large area of suitable habitat by lava flow (Collar and Stuart 1985).

1.3.6. No threat

Although many of the taxa covered here are considered

threatened in some way, there are many taxa which are not thought to be subject to any threat at present. There are no known threats to 36 Old World partridge, quail and francolin, 2 New World quail and 3 guineafowl taxa. Many of these taxa are widely distributed inhabitants of open habitats. For example, many of the African francolins *Francolinus* spp. have distributions greater than 100,000 square kilometres in savannah or scrub and whilst they may suffer population declines locally, they are so widespread that they are not considered at risk of extinction. Two examples from Crowe *et al.* (1986) illustrate this well. The Acacia (Orange River) francolin *F. levaillantoides* is believed to have a range greater than one million square kilometres in two disjunct regions in Africa, the north-east and the south-west, yet there are no recent records from Lesotho, a country of over 30,000 square kilometres surrounded by South Africa. The Natal francolin *F. natalensis* is an endemic resident throughout a large part of southern Africa but is suffering in some areas from land development.

1.3.7. Insufficient information

Many taxa are very poorly known in the wild with respect to both their status and biology. Whilst we have tried to summarise what is known about existing or potential threats for each threatened taxon in this Action Plan, this has not always been possible. In the Old World, the poorly known species are Szechenyi's monal-partridge *Tetraophasis szechenyii*, which is virtually unknown in its south-west China and north-east India range; the Asian migratory quail *Coturnix japonica* which is poorly known in the wild, despite being well known in captivity; the Indian mountain quail *Ophrysia superciliosa*, which may be extinct (Ali and Ripley 1983; Rieger and Walzthony 1992); and one isolated subspecies of the helmeted guineafowl *Numida meleagris sabyi* in Morocco, which was reported only three times during the 1970s (Crowe *et al.* 1986). Information on possible threats is lacking for the rufous-breasted wood-quail *Odontophorus speciosus* and the singing quail *Dactylortyx thoracicus* in the New World. For many species, available information, although cited in recent works (e.g. Crowe *et al.* 1986, Johnsgard 1988), dates back to the 1920s and 1930s and recent data are lacking.

1.4. Action needed to secure the future of partridges, quails, francolins, snowcocks and guineafowl

This section outlines the main forms of conservation action proposed for each species during the workshop and consultation (see section 1.2.3). These fall into three main categories: research, management and other activities.

1.4.1. Research

Extensive survey

Extensive surveys involve the collection of basic information on the presence or absence of a species at various sites and, if possible, information on relative abundance. Baseline surveys are the first step towards understanding a species' requirements and potential threats. Conservation action cannot be proposed without such basic knowledge. A total of 64 taxa lack even the most basic field information on distribution and abundance. For some of these taxa this information is as basic as determining where the species occurs, while for others the information that is needed is the distribution of the taxa in relation to the siting of protected areas.

Most of these taxa are from forested habitats in the tropics. For example, all species inhabiting the dense forests of Sumatra (see project 4.7.1.) and Kalimantan (see project 4.7.2.) in Indonesia are desperately in need of basic distribution information, especially concerning the extent of their occurrence in protected areas. Northern Central America (see project 4.2.1.) and South America (see project 4.2.2.) are two more areas with high densities of extremely poorly known species. In some instances, particular species need surveys for urgent reasons. For example, there may be as few as 1,000 individuals left of the critically threatened Sichuan hill-partridge *Arborophila rufipectus* (He 1992) and surveys for new sites are an urgent priority for galliform conservation in China (see project 4.6.1.). Information is also lacking from many of the remote mountain ranges outside the tropics (e.g. the Caucasus and north-

east Himalaya), particularly for snowcocks (see project 4.4.1.). The distribution of many of the open-country species which inhabit areas of Africa, Europe and the Middle East are reasonably well known on a broad scale through regional atlas projects, for example the Atlas of the Breeding Birds of Arabia (Jennings in prep.) and East Africa (Britton 1980).

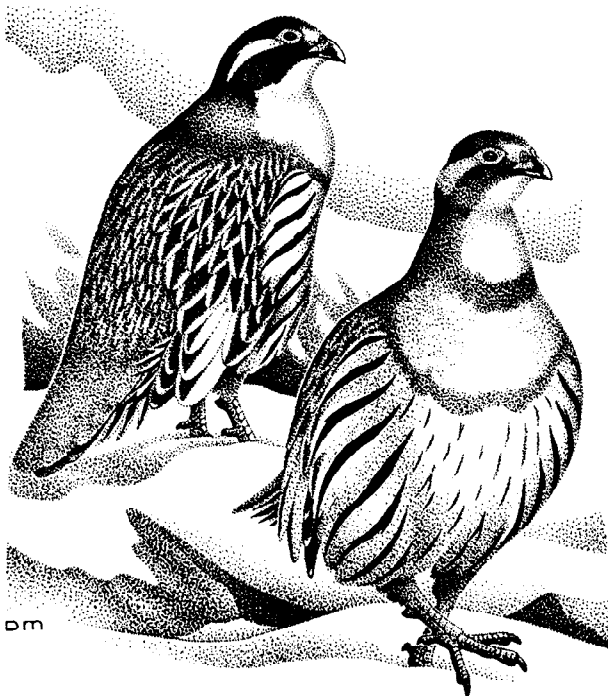
The difference in distributional knowledge between closed-habitat species and open-habitat ones is a result of the logistic ease of survey and the detectability of species. For example, moving around the habitat of many *Alectoris* (Europe and North Africa) and *Francolinus* (Africa and South Asia) species is considerably easier than in areas inhabited by most *Arborophila* (China and south-east Asia) and *Odontophorus* (Central and South America) species. Moreover, many species of grassland and scrub are easier to detect than forest species owing to their conspicuous calling habits.

It is clear, therefore, that many species remain poorly known due to the practical difficulties in carrying out fieldwork. Aids for collecting such data include obtaining recordings of relevant calls available from either regional authorities or sources such as The British Library of Wildlife Sounds (The National Sound Archive, 29 Exhibition Road, London, SW7 2AS, U.K.) or the Library of Natural Sounds (Cornell Laboratory of Ornithology, 159, Sapsucker Rd., Ithaca, NY 14850, U.S.A.), and by detection techniques tailored to individual species (see Bibby *et al.* 1992; Karr 1981; Terborgh 1985).

Intensive research

Intensive research provides detailed knowledge of a species' biology. It is particularly relevant where a species is experiencing major alterations to its habitat with potentially damaging consequences. In this Action Plan it has been proposed for seven species. Eight of them are open country species, again highlighting the problem of studying forest-dwelling species. Two species are considered safe from extinction at present: the grey partridge *Perdix perdix*, the dramatic decline of which still needs addressing despite considerable field research (see Potts 1986) and the rock partridge *A. graeca*, where more biological knowledge is needed for a sustainable hunting regime.

In Asia, the habitat of two species is being replaced by different vegetation. Part of the wet grassland habitat of the swamp francolin *Francolinus gularis* in the terai belt of the Indo-Nepal border is being converted to fields of sugar cane. The species is found in these fields, but it is not known whether the plantations supply all their needs. Hence, assessing the species' breeding success in the agricultural areas is a priority (see project 4.5.1.). In contrast, the habitat of the Sichuan hill-partridge *Arborophila rufipectus* in China is woodland that is currently being logged and replaced by degraded secondary woodlands. Research is needed to assess the species' tolerance of such habitat change (see project 4.6.1.).



Snowcocks

Artist: David Mead

1.4.2. *In situ* management

Habitat protection, management and designation of protected areas

Maintaining the integrity of the habitat in which partridges, quails, francolins, snowcocks and guineafowl occur is the surest way of ensuring that all taxa survive for the future. Thirty-eight taxa are considered to be in need of some form of protection or management in the wild, 35 of these are in the Old World and three are from the New World.

It should be pointed out that management may mean radically different things to temperate and tropical conservationists. As pointed out by MacKinnon *et al.* (1986), management of protected areas in the tropics is limited by lack of knowledge and by the complexity of tropical ecosystems where the most important remaining wildlife habitat is primary habitat. Whereas specific management options can be used to alter secondary and anthropogenic habitats in a predictable way (see Hudson and Rands 1988), changing the composition or structure of primary habitats may have far-reaching and unforeseen consequences on the integrity of the ecosystem. Management of temperate open-country species may imply predator control, hedgerow manipulation and reduction in the use of pesticides (Potts 1986). Among the species whose habitat is intensively managed are the grey partridge of northern Europe (Potts 1986; see also papers on this species in Birkan *et al.* 1992), for which a suite of management options has been proposed, and the northern bobwhite *Colinus virginianus* from the United States (Church and Taylor 1992). In primary tropical forest, management may not involve any biological intervention at all and essentially includes administrative duties (MacKinnon *et al.* 1986), such as protection and regulation of forest product exploitation.

Population monitoring

Monitoring is a useful tool for keeping up-to-date with the status of a species. It has, for example, been used successfully for the grey partridge for over 60 years (Potts 1986). However, it is subject to the same logistic and detectability problems mentioned in Section 1.4.1. for extensive surveys. It is proposed as part of the *in situ* management programme for only two species, the red-billed hill-partridge *Arborophila rubrirostris* of Sumatra, and the Borneo hill-partridge *A. hyperythra*, both of which are considered to be vulnerable. In both cases, determining the extent of their montane habitat is likely to be the most effective method of monitoring population size, given the difficulties in detecting the birds themselves.

Controlling exploitation

Many of the species in this Action Plan are subject to hunting for food and sport, and collecting for the bird-trade. Reducing or eliminating over-exploitation of partridges,

quails, francolins, snowcocks and guineafowl is considered necessary for several taxa as part of the overall *in situ* management programme.

In Africa, the Ahanta francolin *Francolinus achantensis* from West Africa (Gary Allport *in litt.*) and the yellow-necked francolin *F. leucoscepus* from north-east Africa (Crowe *et al.* 1986) would benefit from reduced levels of exploitation. Over-hunting of the globally endangered Djibouti francolin *F. ochropectus* is not one of the major threats facing the species (Welch and Welch 1985), but because the population is so small and subject to many other pressures (see Section 3.2.7.), existing wildlife laws, which have banned hunting in Djibouti since the mid 1970s, must be enforced (Welch and Welch *in litt.*). Whilst the Ahanta and yellow-necked francolins are considered globally safe from extinction at present, over-hunting is believed to have caused local extinctions and this threat must be addressed for the long-term security of the species.

In south-east Asia, the exploitation of four species is excessive. In Thailand, where hunting of ground-dwelling birds is widespread (Round 1988), reducing this exploitation is vital for the survival of the endangered Thai subspecies of the chestnut-headed hill-partridge *Arborophila cambodiana diversa* and the widely distributed but vulnerable crested wood-partridge *Rollulus rouloul*. Further south, on the Indonesian island of Java, both hunting and trapping for the bird trade must be reduced or stopped to secure the survival of the vulnerable Javan subspecies of the bare-throated hill-partridge *Arborophila orientalis orientalis* and of the vulnerable Javan hill-partridge *A. javanica*, a Javanese endemic.

In Central and South America, not enough is currently known about the effects of hunting on Neotropical quails to estimate whether populations are being over-exploited or not. Given the importance of the closely related cracids (Cracidae) as a source of protein in the diet of many indigenous human populations throughout the region (Strahl and Grajal 1991), neotropical quail may also be in need of protection from excessive consumptive use.

Sustainable use

In some countries partridges, quails, francolins, snowcocks and guineafowl are commonly known as gamebirds because they are, or have the potential to be, shot for recreational purposes. Species which are suitable candidates for sustainable sport-hunting are typically those that inhabit open or lightly wooded habitats in countries where shooting birds for sport is economically feasible. In such cases the economic incentives that result from such hunting can be used to promote the careful management of species and their habitats and provide a means of conserving both habitats and birds (Potts 1992). Harvesting species in this way requires monitoring to enable determination of the sustainable yield of a population and therefore avoid over-exploitation. Sustainable yields can be increased by improving the quality

of the species' environment through habitat management (Aebischer 1991). In the Cape Province of South Africa, for example, the grey-winged francolin *Francolinus africanus* has become the subject of a commercially viable sport-hunting concern over the last ten years (Little and Crowe 1992; 1993; Little *et al.* 1993). Other South African species, such as Swainson's francolin *F. swainsonii*, the crested francolin *F. sephaena*, the Natal francolin *F. natalensis* and the helmeted guineafowl *Numida meleagris* are also hunted commercially (Rob Little *in litt.*).

Sustainable hunting is proposed as a way forward for four Old World species, the red-legged partridge *Alectoris rufa*, the grey francolin *Francolinus pondicerianus*, the grey-winged francolin *F. africanus* and the grey partridge *Perdix perdix*. It may also be used to safeguard the future of one New World quail, the crested bobwhite *Colinus cristatus*.

Intensive management of existing captive populations

Many species of partridges, quails and francolins have long been kept in captivity and the husbandry necessary for many of the species to flourish under such conditions is well known (Robbins 1981; 1992). Consequently, the number of individuals of many species can be increased quickly and the captive population can safeguard against the extinction of the species in the wild. An added benefit is the opportunity for biological research at close quarters, with possible application to wild populations.

Captive breeding has been proposed only for species that

already exist in captivity. Whenever captive breeding is considered for a species which is not already in captivity, it should first be subject to a Population and Habitat Viability Assessment (PHVA) (see Section 1.4.3.).

Four Old World partridge are currently considered priorities for captive management: Erckel's francolin *Francolinus erckelii*, Madagascar partridge *Margaroperdix madagarensis*, black wood-partridge *Melanoperdix nigra* and crested wood-partridge *Rollulus rouloul*. In addition, the Sichuan hill-partridge *Arborophila rufipectus*, Djibouti francolin *Francolinus ochropectus* and bearded tree-quail *Dendrortyx barbatus* may be considered for captive breeding, as part of an overall conservation programme for these species.

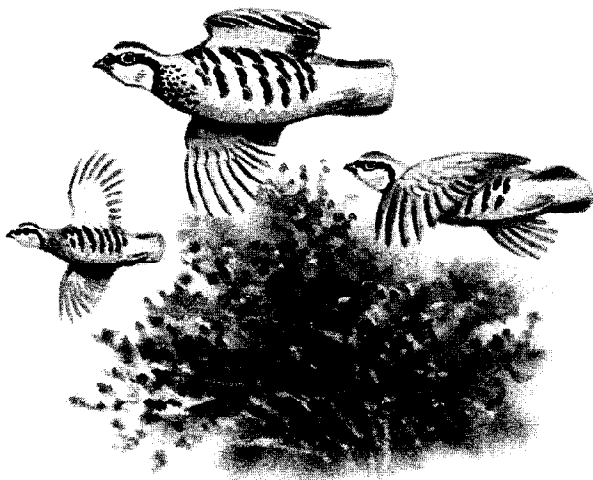
1.4.3. Other activities

Education

Education is typically aimed at raising the awareness of communities about the plight of wild areas and species. Currently, most partridges, quails, francolins, snowcocks and guineafowl are not high profile species. Therefore, efforts to raise awareness about the plight of these species will form part of wider conservation education programmes or will arise from the work of particular conservationists. The PQF Specialist Group is keen to promote both types of education initiative at every opportunity. At present an education programme is proposed specifically for the endangered Djibouti francolin *Francolinus ochropectus* from the Horn of Africa and the critically threatened Sichuan hill-partridge *Arborophila rufipectus* from south-west China. In both cases a suite of measures is necessary to prevent the species in question from becoming extinct, one being a community education programme to increase the awareness of local people about its status. An education programme is also proposed for the bearded tree-quail *Dendrortyx barbatus*.

Population and Habitat Viability Assessment

This aims to identify particular threats to a species' survival in order to formulate a recovery plan. The exercise has been developed by the Captive Breeding Specialist Group (CBSG) of the Species Survival Commission. It involves discussion of the size and structure of the population and the threats facing it. This provides the information needed to assess the likelihood of the population going extinct, using computer modelling. The models predict how the structure and genetic variation of the population changes over a set number of generations, given particular rates of birth, recruitment, reproduction and death. The procedure also explores the outcome of various management options, seeking ones that reduce the vulnerability to extinction (Clark *et al.* 1991). One option considered during this process is captive breeding. Such simulations are termed



Red-legged partridge

Artist: Richard Robjent

Population Viability Analyses and the most commonly used computer programme is VORTEX (CBSG 1992). For further details of the technicalities of this process, contact the Chairman, Captive Breeding Specialist Group, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124, USA.

This option is considered important for four taxa, three from Africa and one from China. Two taxa are endangered Moroccan subspecies that are isolated from their otherwise safe and widely distributed conspecifics, the Moroccan double-spurred francolin *Francolinus bicalcaratus ayesha* and the Moroccan helmeted guineafowl *Numida meleagris sabyi*. In both instances, although the threatened taxa are believed to have small populations and are little known, many of the population biology parameters required for the computer simulation mentioned above are known for the other widespread subspecies within the species (e.g. Crowe *et al.* 1986).

The third species is the endangered Djibouti francolin *Francolinus ochropectus*, a species subject to severe degradation of its habitat in the war-torn Horn of Africa. In this case, extinction by the end of this century is predicted unless human impact on its habitat is greatly reduced (Collar and Stuart 1985).

This procedure could also be useful for the critically threatened Sichuan hill-partridge *Arborophila rufipectus* and the bearded tree-quail *Dendroortyx barbatus*, particularly in assessing whether captive populations should be established.

Taxonomic clarification

In order to promote the conservation of all partridges, quails, francolins, snowcocks and guineafowl, the species of concern must be clearly defined. Once they have been

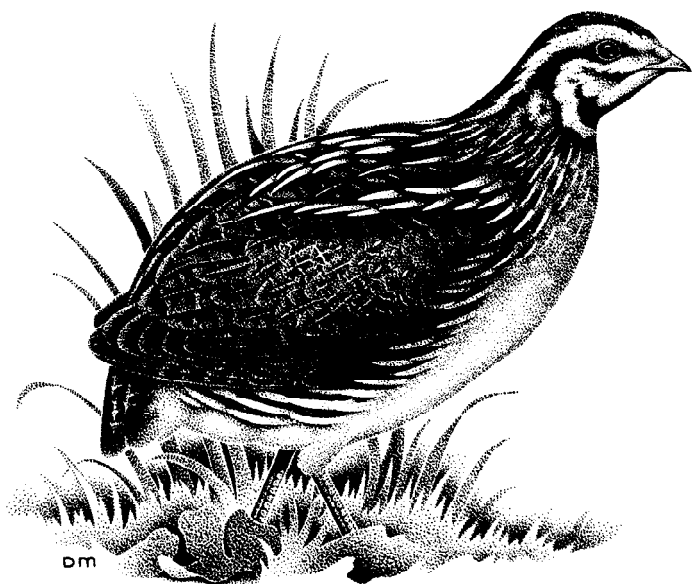
identified, practical species-orientated conservation measures can be proposed. Knowing the taxonomic relationships between species allows the use of ecological characteristics from well-known species to predict the likely characteristics of related species for which there are few data (Brooks *et al.* 1992).

By and large the species which have reasonably well-known distributions are also those with the clearest taxonomic status. Conversely, many of the species in urgent need of extensive surveys also require taxonomic clarification as they are known from only a few specimens. These include taxa considered in this Action Plan as four species of *Arborophila* from south-east Asia (Davison 1982; Johnsgard 1988; Sibley and Monroe 1990), three of *Colinus* from Central America and seven of *Odontophorus* from Central and South America (Johnsgard 1988; Sibley and Monroe 1990). The genus *Coturnix* also requires attention as the number of species has been given as seven (Johnsgard 1988), nine (Sibley and Monroe 1990) and between eight and ten (Crowe *et al.* 1986).

No conservation action is required at present

All species require continual revision of their status and the collection of information on all aspects of their biology and the threats to their survival. For 64 partridge, quail, francolin, snowcock and guineafowl taxa that are considered safe from extinction at present, it is believed that no conservation action is currently required. In the Old World, these species are typically widely distributed inhabitants of open terrain (e.g. savannah, scrub and arid areas) and include the majority of *Tetraogallus*, *Alectoris*, *Francolinus*, *Perdica* and *Coturnix* species. Neotropical species for which no immediate action is proposed are also widely distributed, having ranges of greater than 100,000 square kilometres, except for the barred quail *Philortyx fasciatus* from central Mexico that occupies a range of less than 50,000 square kilometres (ICBP 1992).

Although these taxa are not regarded as priorities for conservation action in a global context, action may be needed locally to prevent them from becoming extinct in some parts of their range. As well as potentially requiring attention on a local scale, it must be stressed that all but a handful of partridges, quails, francolins, snowcocks and guineafowl are very poorly known in their native ranges. Even well-studied species may have poorly known subspecies, for example the nominate race of the bobwhite *Colinus virginianus* is very well researched in the U.S.A. but the Mexican and Central American subspecies are poorly known. These birds provide a wealth of opportunity in a variety of conservation-orientated research areas, such as studies leading to wise-use, where sustainable sport hunting could provide an economic incentive to conserve species and their habitats (Aebischer 1991; Hudson and Rands 1988).



European migratory quail

Artist: David Mead

2. Summary of conservation assessment

This chapter presents a summary of the conservation assessment conducted as a first stage in determining global conservation priorities for all partridge, quail, francolin, snowcock and guineafowl species. The collation, assessment and review of this information is outlined in section 1.2.3 and this chapter summarises the information presented in the Conservation Assessment Workshop report (McGowan *et al.*, in press).

2.1. Mace-Lande threat categories

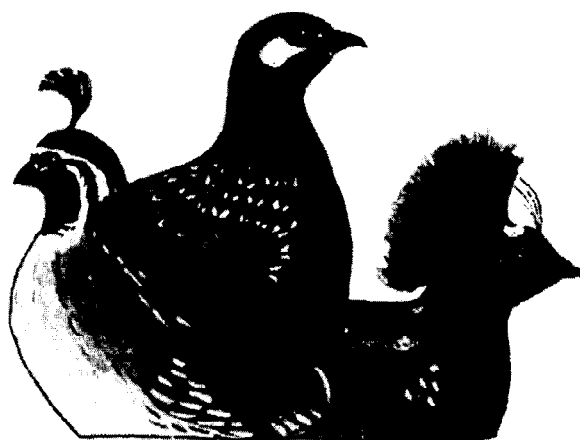
IUCN recognised the need to revise its Red List Categories some years ago. It was decided to develop a system whereby species would be assigned to the categories on the basis of more objective, and quantifiable criteria. It was inevitable that until such a framework for determining threat was developed, the assignment of species to categories would remain relatively subjective, thus making it difficult to draw meaningful comparisons between species in assessing priorities. The revision process included the preparation of a number of draft revisions, extensive rounds of review and further revision until sufficiently broad consensus was reached on the criteria, the categories, and guidance text on how to apply the new categories. During this process a number of draft revisions were used to test the feasibility of the proposed criteria within the SSC network. The final version of the IUCN Red List Categories was approved by the 40th Meeting of the IUCN Council, in Gland, Switzerland, on 30 November 1994.

This Action Plan was being compiled whilst the Red List Categories were being revised, and the species in this Action Plan were assigned to the categories in an early draft version, which were referred to at that time as the Mace-

Lande categories. The new Red List Categories continued to be developed as the Action Plan was being finalised, and it was decided not to delay the publication of this plan by going back to rework the categorisation of each species.

Assignment of the Mace-Lande categories was made at the Conservation Assessment Workshop (see section 1.2.3) and has been extensively reviewed by the Partridge Quail and Francolin (PQF) Specialist Group and others (see Acknowledgements). The Mace-Lande proposals are based upon population theory, and their use during the compilation of this Action Plan forced serious consideration of the reasons why a species is considered threatened. In particular, attention to the time scale, estimated population size and decline, number of known population or habitat fragments and the projected rate of habitat loss ensure that the same subjective assessment of supporting data is applied to each taxon. Inevitably, the quality of data vary considerably between taxa (e.g. compare the widely studied grey partridge *Perdix perdix* and northern bobwhite *Colinus virginianus* with the orange-necked hill-partridge *Arborophila davidi*, known only from the type specimen until sighted twice in 1991), but attention to the same procedure of assigning threat should reduce the level of subjectivity and provide greater comparability between taxa than has hitherto been the case. Assessment of criteria for assigning Mace-Lande categories is summarised in table 2.1.

We expect that as conservationists work with this Action Plan, the new and updated information that will become available on the status of species will allow assignment to the new IUCN Red List Criteria. We expect that as conservationists work with the Action Plan, new and updated information will become available on the status of species, which can be used in future publications.



POPULATION TRAIT	CRITICAL	ENDANGERED	VULNERABLE
Probability of extinction	50% within 5 years or 2 generations, whichever is longer	20% within 20 years or 10 generations, whichever is longer	10% within 100 years
	OR	OR	OR
	Any 2 of the following criteria	Any 2 of the following criteria or any 1 CRITICAL criterion	Any 2 of the following criteria or any 1 ENDANGERED criterion
Effective population N_e corresponding to Total population N	< 50 < 250	< 500 < 2,500	< 2,000 < 10,000
Subpopulations	≤ 2 with $N_e > 25$, $N > 125$ with immigration < 1/generation	≤ 5 with $N_e > 100$, $N > 500$ or ≤ 2 with $N_e > 250$, $N > 1,250$ with immigration < 1/generation	≤ 5 with $N_e > 500$, $N > 2,500$ or ≤ 2 with $N_e > 1,000$, $N > 5,000$ with immigration < 1/generation
Population decline	> 20%/year for last 2 years or > 50% in last generation	> 5%/year for last 5 years or > 10%/generation for last 2 years	> 1%/year for last 10 years or > 10%/generation for last 2 years
Catastrophe: rate and effect	> 50% decline/5-10 years or 2-4 generations; subpopulations highly correlated	> 20% decline/5-10 years or 2-4 generations; > 50% decline/10-20 years, 5-10 generations; subpopulations highly correlated	> 10% decline/5-10 years; > 20% decline/10-20 years; > 50% decline/50 years; subpopulations correlated
OR			
Habitat change	resulting in above population effects	resulting in above population effects	resulting in above population effects
OR			
Commercial exploitation or interactions with introduced taxa	resulting in above population effects	resulting in above population effects	resulting in above population effects

Table 2.1. Mace-Lande categories and their associated criteria (after Mace and Lande 1991; CBSG 1992).

2.2. The Conservation Assessment Table

The entry for each taxon in the Conservation Assessment Table below gives the following information:

1. Scientific name and English name - the species-level taxonomy follows Sibley and Monroe (1990), except for African species which follow Crowe *et al.* (1986). Where given, subspecies names are taken from Johnsgard (1988), as are the English names.
2. Subsp. - the number of extant subspecies in the species or subspecies-group. These are taken from Johnsgard (1988) with some alterations.
3. Area - indicates the extent of the geographical area covered by the range of the taxon.
Is = Island less than 50, 000 sq. kilometres (smaller than Costa Rica)
A = Continental range less than 50, 000 sq. kilometres (smaller than Costa Rica)
B = Continental range between 50, 000 and 100, 000 sq. kilometres (between Costa Rica and Iceland)
C = Continental range between 100, 000 and 500, 000 sq. kilometres (between Iceland and Thailand)
D = Continental range between 500, 000 and 1, 000, 000 sq. kilometres (between Thailand and Egypt)
E = Continental range greater than 1, 000, 000 sq. kilometres (larger than Egypt)
- Species coded 'A' and 'Is' are coded from the BirdLife International Biodiversity project (unpub. list; see ICBP 1992). Other species' ranges are coded from published sources. Range maps in Johnsgard (1988) and Crowe *et al.* (1986) have been compared with country area statistics given in *Collins Atlas of the World* 2nd edition (1991).
4. Range countries/regions/islands - a geographical description of the range of the taxon. This follows the description given in Sibley and Monroe (1990) for taxa considered in that treatment and Johnsgard (1988) for others (*e.g.* subspecies). Countries/regions where a self-maintaining wild population survives as a result of introduction are given in brackets.
5. Popⁿ Size - a first attempt, order of magnitude estimate of the number of individuals of the taxon.
6. Popⁿ trend - a qualitative assessment of the current change in global population size, coded as follows: I = increasing; S = stable; D = decreasing.
7. Threats - current causes for the decline in species numbers and predictions of future problems. This assessment is based upon published sources and information contributed by correspondents. These threats are explained in section 1.3.
8. M-L cat. - the Mace-Lande threat category assigned at the Conservation Assessment Workshop and reviewed by the PQF Specialist Group (see section 1.2.3), coded as follows: Ex = extinct; C= critical; E = endangered; V = vulnerable; S = safe; ? = unknown but lack of knowledge is cause for concern.
9. Future actions - conservation measures proposed by the Specialist Group as a result of the conservation assessment exercise and explained in section 1.4.

SCIENTIFIC NAME ENGLISH NAME	Sub spp	AREA	RANGE COUNTRIES/ REGIONS/ISLANDS	POP ^N SIZE	POP ^N TREND	THREATS	M-L CAT.	FUTURE ACTIONS
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PHASIANIDAE (PERDICINAE)								
<i>Lerwa lerwa</i> Snow partridge	-	E	Pakistan, India, China Nepal, Tibet, Bhutan	100,000- 1,000,000	D	Habitat loss, Hunting	S	None needed at present
<i>Ammoperdix griseogularis</i> See-see partridge	-	D	Turkey, Iraq, Iran, Pakistan, Afghanistan, Uzbekistan, Tadzhikistan		?	No threat	?	Survey
<i>Ammoperdix heyi</i> Sand partridge	4	D	Egypt, Sudan, Arabia, Israel, Jordan	>100,000	S	No threat	S	None needed at present
<i>Tetraogallus caucasicus</i> Caucasian snowcock	-	A	Russia, Georgia	>400,000	S	No threat	S	None needed at present
<i>Tetraogallus caspius</i> Caspian snowcock	3	A	Turkey, Iran, Armenia, Azerbaijan	2,000- 5,000	D	Habitat loss	V	Survey
<i>Tetraogallus tibetanus</i> Tibetan snowcock	4	D	India, China, Afghanistan, Tadzhikistan, Tibet	100,000- 1,000,000	S	No threat	S	None needed at present
<i>Tetraogallus altaicus</i> Altai snowcock	2	B	Siberia, Mongolia, N Xingjiang in China	50,000- 150,000	S/D	Hunting, Habitat loss	S	Survey
<i>Tetraogallus himalayensis</i> Himalayan snowcock	5	E	Afghanistan, India, China, Pakistan, Nepal, Bhutan	10,000- 100,000	S	No threat	S	None needed at present
<i>Tetraophasis obscurus</i> Verreaux's monal-partridge	-	?C	China	?	D	Habitat loss	?	Survey, Taxonomic clarification
<i>Tetraophasis szechenyi</i> Szechenyi's monal-partridge	-	?C	China, India, Burma?, Tibet	?	?	Insufficient information	?	Survey, Taxonomic clarification
<i>Alectoris graeca</i> Rock partridge	3	C	France, Italy, Croatia, Serbia, Bosnia, Austria, Bulgaria, Sicily, Greece, Switzerland	30,000- 70,000	D	Habitat loss, Hunting, Hybridisation	S	<i>In situ</i> management, Intensive research
<i>Alectoris chukar</i> Chukar partridge	14	E	Central Asia from Turkey to NE China, (USA, W Europe, Hawaii, New Zealand, St. Helena, Robben Is. South Africa)	>1,000,000	S	Habitat loss	S	None needed at present
<i>Alectoris philbyi</i> Philby's rock partridge	-	A	SW Arabia	5,000- 50,000	?S	No threat	S	None needed at present
<i>Alectoris magna</i> Przhevalski's rock partridge	-	A	China	±100,000	S/D	Habitat loss, Pesticides, Hunting	S	<i>In situ</i> management
<i>Alectoris barbara</i> Barbary partridge	4	E	Morocco, Algeria, Tunisia, Libya, Sardinia, (Canary Islands, Gibraltar)	>500,000	D	Hunting, Habitat loss	S	None needed at present
<i>Alectoris rufa</i> Red-legged partridge	3	D	France, Spain, Portugal, Italy, (England, Canary Islands)	>1,000,000	S/D	Hybridisation, Habitat loss, Hunting	S	Sustainable use
<i>Alectoris melanocephala</i> Arabian red-legged partridge	2	C	Arabia	50,000- 500,000	S	No threat	S	None needed at present
<i>Francolinus pondicerianus</i> Grey francolin	3	E	Iran, Pakistan, India, Nepal, Sri Lanka, (Oman, Hawaii, Mauritius, Réunion, Seychelles, Rodrigues)	100,000- >1,000,000	S/D	Pesticides, Habitat loss	S	Sustainable use

SCIENTIFIC NAME ENGLISH NAME	Sub spp	AREA	RANGE COUNTRIES/ REGIONS/ISLANDS	POP ^N SIZE	POP ^N TREND	THREATS	M-L CAT.	FUTURE ACTIONS
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<i>Francolinus pintadeanus</i> Chinese francolin	2	E	E India, SE China, Burma, Indochina, (Madagascar, Mascarene Islands, Philippines)	>100,000-	S	No threat	S	None needed at present
<i>Francolinus francolinus</i> Black francolin	6	E	Cyprus, Iraq, Syria, Iran, Afghanistan, Nepal, Bangladesh, Pakistan, India, (USA, Hawaii, Guam, Italy)	100,000- 1,000,000	S/D	Habitat loss, Pesticides	S	None needed at present
<i>Francolinus pictus</i> Painted francolin	2							
<i>F.p.pictus/pallidus</i>	-	E	India	10,000- 1,000,000	D	Habitat loss	S	None needed at present
<i>F.p.watsoni</i>	-	Is	Sri Lanka	1,000- 10,000	D	Habitat loss, Hunting	V	Survey
<i>Francolinus gularis</i> Swamp francolin	-	C	India, Nepal, Bangladesh	1,000- 10,000	D	Hunting, ?Pesticides, Habitat loss	V	Intensive research, <i>In situ</i> management
<i>Francolinus lathamii</i> Latham's francolin	2	E	Equatorial W Africa, E to Uganda	>100,000	?S	Habitat loss	S	None needed at present
<i>Francolinus coqui</i> Coqui francolin	4	E	Sub-Saharan Africa	>1,000,000	?	Habitat loss	S	None needed at present
<i>Francolinus albogularis</i> White-throated francolin	3	E	Senegal, Gambia, Cameroon, Angola, Zaire, Ghana, Togo, Benin, Nigeria	>100,000	?	No threat	S	None needed at present
<i>Francolinus schlegelii</i> Schlegel's banded francolin	-	C	Cameroon, Chad, Central African Republic, Sudan	50,000- 500,000	?	No threat	?	None needed at present
<i>Francolinus streptophorus</i> Ring-necked francolin	-	C	Cameroon, Uganda, Kenya, Tanzania	100,000- 500,000	?	No threat	S	None needed at present
<i>Francolinus finschi</i> Finsch's francolin	-	C	Zaire, Angola	10,000- 100,000	?	No threat	S	Survey
<i>Francolinus africanus</i> Grey-winged francolin	-	D	Lesotho, South Africa	>500,000	D	Habitat loss	S	Sustainable use
<i>Francolinus levaillantii</i> Levaillant's (red-winged) francolin	2	D	Angola, Zaire, Uganda, Kenya, Rwanda, Burundi, Tanzania, Malawi, South Africa, Mozambique	>1,000,000	?	Habitat loss	S	None needed at present
<i>Francolinus levaillantoides</i> Acacia (Orange River) francolin	4	E	Sudan, Uganda, Ethiopia, Somalia, Angola, Namibia, Botswana, South Africa	>1,000,000	I/S	No threat	S	None needed at present
<i>Francolinus psilolaemus</i> Montane red-winged (moorland) francolin	2	C	Ethiopia, Kenya, Uganda	50,000- 500,000	?	No threat	S	None needed at present
<i>Francolinus shelleyi</i> Shelley's francolin	2	E	East and SE Africa	>1,000,000	?	Habitat loss	S	None needed at present

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<i>Fringilla sephaena</i> Crested francolin	5	E	Angola, Zambia, Malawi, Tanzania, Uganda, Zaire, Sudan, Ethiopia, Kenya, Namibia, Botswana, South Africa.Zimbabwe, Mozambique, Somalia, Djibouti	>1,000,000	S	No threat	S	None needed at present
<i>Fringilla achantensis</i> Ahanta francolin	-	C	Gambia, Senegal, Nigeria, Sierra Leone, Guinea, Togo, Liberia, Cote d'Ivoire, Ghana	10,000- 50,000	S/D	Habitat loss, Hunting	S	<i>In situ</i> management, Survey
<i>Fringilla squamatus</i> Scaly francolin	-	E	Nigeria, Cameroon, Central African Republic, Sudan, Kenya, Ethiopia, Angola, Zaire, Malawi, Tanzania, Uganda, Rwanda, Burundi, Congo, Gabon, Equatorial Guinea	>1,000,000	D	No threat	S	None needed at present
<i>Fringilla griseostriatus</i> Grey-striped francolin	-	A	Angola	5,000- 50,000	D	No threat	?	Survey
<i>Fringilla nahani</i> Nahan's forest francolin	-	B	Zaire, Uganda	5,000- 20,000	?D	Habitat loss	?	Survey, <i>In situ</i> management
<i>Fringilla hartlaubi</i> Hartlaub's francolin	-	C	Angola, Namibia	50,000- 500,000	S/D	Granite mining, Habitat loss	S	Survey
<i>Fringilla hildebrandti</i> Hildebrandt's francolin	-	E	Uganda, Kenya, Burundi, Zaire, Tanzania, Zambia, Malawi, Mozambique, Rwanda	500,000- 1,000,000	?	No threat	S	None needed at present
<i>Fringilla natalensis</i> Natal francolin	-	E	Zambia, Mozambique, Zimbabwe, Botswana, South Africa	>1,000,000	S	No threat	S	None needed at present
<i>Fringilla bicalcaratus</i> Double-spurred francolin	2							
<i>F.b.bicalcaratus</i>	-	E	Sub-Saharan W Africa	>1,000,000	?S	No threat	S	None needed at present
<i>F.b.ayesha</i>	-	A	Morocco	100-1,000	I	Habitat loss, Hunting	E	Survey, Taxonomic clarification, <i>In situ</i> management, Intensive research, PHVA
<i>Fringilla clappertoni</i> Clapperton's francolin	-	E	Niger, Nigeria, Sudan, Ethiopia, Cameroon, Chad, Uganda, Kenya, Eritrea, Mali	>1,000,000	S/D	Habitat loss, Hunting	S	None needed at present
<i>Fringilla icterorhynchus</i> Yellow-billed (Heuglin) francolin	-	E	Central African Republic, Sudan, Zaire, Uganda	1,000,000	S	No threat	S	None needed at present
<i>Fringilla harwoodi</i> Harwood's francolin	-	A	Ethiopia	?2,000- 20,000	?	?Hunting	S	Survey
<i>Fringilla capensis</i> Cape francolin	-	C	Namibia, South Africa	50,000- 500,000	?S	No threat	S	None needed at present
<i>Fringilla adspersus</i> Red-billed francolin	-	D	Angola, Zambia, South Africa, Namibia, Botswana, Zimbabwe	>1,000,000	S	Habitat loss	S	None needed at present

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<i>Francolinus camerunensis</i> Cameroon mountain francolin	-	A	Cameroon	±2,000	?S	Volcanic lava	V	<i>In situ</i> management, Survey
<i>Francolinus swierstrai</i> Swierstra's francolin	-	A	Angola	5,000- 50,000	D	Habitat loss	V	<i>In situ</i> management, Survey
<i>Francolinus erckelii</i> Erckel's francolin	-	C	Sudan, Ethiopia, Eritrea, (Hawaii)	5,000- 50,000	S/D	Habitat loss	S	Survey, Captive management
<i>Francolinus ochropectus</i> Djibouti francolin	-	A	Djibouti	<1,000	D	Habitat loss, Hunting	E	Survey, Intensive research, <i>In situ</i> management, PHVA, Education
<i>Francolinus castaneicollis</i> Chestnut-naped francolin	2	C	Ethiopia, Somalia	100,000- 500,000	S	No threat	S	None needed at present
<i>Francolinus nobilis</i> Handsome francolin	-	A	Zaire, Uganda, Rwanda, Burundi	2,000- 20,000	?S	Habitat loss	S	Survey
<i>Francolinus jacksoni</i> Jackson's francolin	-	A	Kenya	5,000- 50,000	?D	Hunting, Habitat loss	S	Survey
<i>Francolinus leucoscepus</i> Yellow-necked francolin	-	E	Ethiopia, Eritrea, Somalia, Djibouti, Kenya, Uganda, Tanzania	500,000- 1,000,000	D	Hunting	S	<i>In situ</i> management, Survey
<i>Francolinus rufopictus</i> Grey-breasted francolin	-	A	W Tanzania	10,000- 100,000	D	?Habitat loss	S	Survey
<i>Francolinus afer</i> Red-necked francolin	7	E	South Central and SE Africa	>1,000,000	S	No threat	S	None needed at present
<i>Francolinus swainsonii</i> Swainson's francolin	3	E	Namibia, Zambia, Malawi, Zimbabwe, Botswana, Mozambique, South Africa	>1,000,000	I	No threat	S	None needed at present
<i>Perdix perdix</i> Grey partridge	8	E	Europe, Russia, Turkey, Caucasus States, NW Iran, (USA, Canada)	>1,000,000	D	Habitat loss, Pesticides	S	Intensive research, Sustainable use
<i>Perdix dauuricae</i> Daurian partridge	2	E	Siberia, China, Mongolia, Russia	100,000- >1,000,000	S/D	No threat	S	None needed at present
<i>Perdix hodgsoniae</i> Tibetan partridge	3	?D	China, India, Tibet, Nepal	100,000- 1,000,000	?S	?Habitat loss	S	Survey
<i>Rhizothera longirostris</i> Long-billed wood-partridge	2	D	Malay Peninsula, Sumatra, Borneo	>1,000	?D	Habitat loss, Hunting	V	<i>In situ</i> management
<i>Margaroperdix madagascarensis</i> Madagascar partridge	-	C	Madagascar	10,000- 100,000	D	Hunting, Habitat loss	V	Survey, Captive management, <i>In situ</i> management
<i>Melanoperdix nigra</i> Black wood-partridge	2	D	Malaya, Sumatra, Borneo	>1,000	D	Habitat loss	V	Survey, <i>In situ</i> management, Captive management
<i>Coturnix coturnix</i> European migratory quail	?5	E	Breeding Range: Europe, W and C Asia, southern Africa. Wintering Range: Sub-Saharan, NE, SW and N Africa	>1,000,000	S/D	Habitat, Hunting	S	Taxonomic clarification

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<i>Coturnix japonica</i> Asian migratory quail	-	D	Breeding Range: Siberia, Mongolia, NE China, Japan Wintering Range: S and SE Asia	>10,000	?S	Insufficient information	S	None needed at present
<i>Coturnix pectoralis</i> Stubble quail	-	D	Australia	>100,000	S	No threat	S	None needed at present
<i>Coturnix coromandelica</i> Rain quail	-	E	Pakistan, Bangladesh, India, Burma, Thailand, Sri Lanka.	100,000- 1,000,000	S	Habitat loss, Pesticides	S	None needed at present
<i>Coturnix delegorguei</i> Harlequin quail	3	E	Sub-Saharan Africa, Madagascar	>1,000,000	S	No threat	S	None needed at present
<i>Coturnix ypsilophora</i> Brown quail	12	E	Lesser Sundas Islands, New Guinea, Australia	>1,000,000	S	No threat	S	None needed at present
<i>Coturnix adansonii</i> African blue quail	-	E	Sub-Saharan W, C and SE Africa	>1,000,000	S	No threat	S	Taxonomic clarification
<i>Coturnix chinensis</i> Asian blue quail	10	E	S and SE Asia, New Guinea, NE Australia	>1,000,000	S	Habitat loss, Pesticides	S	Taxonomic clarification
<i>Anurophasis monorthonyx</i> Snow mountain quail	-	A	New Guinea	<10,000	S	No threat	S	None needed at present
<i>Perdica asiatica</i> Jungle bush-quail	4	D	India, Pakistan	100,000- >1,000,000	S/D	No threat	S	Taxonomic clarification
<i>Perdica argoondah</i> Rock bush-quail	3	E	India, Sri Lanka	>100,000	S/D	Habitat loss, Hunting	S	None needed at present
<i>Perdica erythrorhyncha</i> Painted bush-quail	2	D	India, Bangladesh	>100,000	S	No threat	S	None needed at present
<i>Perdica manipurensis</i> Manipur bush-quail	2	A	India	100- 10,000	D	Habitat loss, Hunting	C	Survey, Intensive research
<i>Xenoperdix udzungwensis</i> Udzungwa forest partridge	-	A	Tanzania	1,000- 10,000	S	No threat	V	Survey, <i>In situ</i> management
<i>Arborophila torqueola</i> Necklaced (common) hill-partridge	4	D	India, China, Burma, Vietnam, Nepal, Bhutan	100,000- 1,000,000	D	Habitat loss	S	None needed at present
<i>Arborophila rufogularis</i> Rufous-throated hill-partridge	6	D	India, Nepal, China, Burma, Bhutan, Thailand, Laos, Vietnam	10,000- 100,000	D	Habitat loss	S	None needed at present
<i>Arborophila atrogularis</i> White-cheeked hill-partridge	-	C	India, China, Burma	10,000- 100,000	?D	Habitat loss, ?Hunting	S	Survey
<i>Arborophila crudigularis</i> White-throated (Taiwan) hill-partridge	-	Is	Taiwan	?1,000- 10,000	D	Habitat loss, ?Pesticides	V	Survey
<i>Arborophila mandellii</i> Red-breasted hill-partridge	-	A	India, Tibet, Bhutan	?1,000- 100,000	?D	Habitat loss	V	Survey
<i>Arborophila brunneopectus</i> Brown-breasted hill-partridge	3							
<i>A.b.albigula/heniriki</i>	2	A	Vietnam, ?China	1,000- 100,000	D	Habitat loss, Hunting	V	Survey, <i>In situ</i> management
<i>A.b.brunneopectus</i>	-	C	China, Thailand, Laos	100,000- 1,000,000	D	Habitat loss, Hunting	S	None needed at present

SCIENTIFIC NAME ENGLISH NAME	Sub spp	AREA	RANGE COUNTRIES/ REGIONS/ISLANDS	POP ^N SIZE	POP ^N TREND	THREATS	M-L CAT.	FUTURE ACTIONS
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<i>Arborophila rufipectus</i> Sichuan hill-partridge	1	A	China	±1,000	D	Habitat loss	C	Survey, <i>In situ</i> management, Intensive research, PHVA, Education
<i>Arborophila orientalis</i> Bare-throated hill-partridge	4	C						Taxonomic clarification
<i>A.o.orientalis</i>	-	A	Java	1,000-10,000	?D	Habitat loss, Bird trade, hunting	V	<i>In situ</i> management, Control bird trade
<i>A.o.rolli/sumatrana/campbelli</i>	3	C	Sumatra, Malay Peninsula	10,000-100,000	?D	Habitat loss	V	<i>In situ</i> management
<i>Arborophila javanica</i> Javan hill-partridge	3	A	Java	>10,000	?D	Bird trade, Habitat loss	V	Control bird trade, <i>In situ</i> management
<i>Arborophila gingica</i> Collared hill-partridge	-	B	Mainland China, (Taiwan)	?100-10,000	D	Habitat loss	E	Survey, <i>In situ</i> management
<i>Arborophila davidi</i> Orange-necked hill-partridge	-	A	Vietnam	100-1,000	?D	Habitat loss	E	Survey, <i>In situ</i> management
<i>Arborophila cambodiana</i> Chestnut-headed hill-partridge	2	A						Taxonomic clarification
<i>A.c.cambodiana</i>	-	A	Cambodia	>100	?D	Habitat loss	V	Survey
<i>A.c.diversa</i>	-	A	Thailand	100-1,000	?D	Habitat loss, Hunting	E	<i>In situ</i> management
<i>Arborophila rubrirostris</i> Red-billed hill-partridge	-	B	Sumatra	>10,000	?S	Habitat loss	V	<i>In situ</i> management
<i>Arborophila hyperythra</i> Borneo hill-partridge	2	B	Borneo	>10,000	?S	Habitat loss	V	<i>In situ</i> management, Taxonomic clarification
<i>Arborophila ardens</i> White-eared (Hainan) hill-partridge	-	Is	Hainan Island, China	?100-10,000	D	Habitat loss	E	Survey, <i>In situ</i> management
<i>Arborophila chloropus</i> Green-legged hill-partridge	4	D	Burma, China, Thailand, Indochina	10,000-1,000,000	D	Habitat loss	S	None needed at present
<i>Arborophila merlini</i> Annamese hill-partridge	-	B	Vietnam	>100	D	Habitat loss	E	<i>In situ</i> management, Survey
<i>Arborophila charltonii</i> Scaly-breasted hill-partridge	3							Taxonomic clarification
<i>A.c.atjenensis</i>	-	A	Sumatra	?10-100	D	Habitat loss	C	Survey, <i>In situ</i> management
<i>A.c.graydoni</i>	-	A	Borneo	>100	D	Habitat loss	E	Survey, <i>In situ</i> management
<i>A.c.charltonii</i>	-	A	Malay Peninsula.	100-10,000	D	Habitat loss	E	Survey, <i>In situ</i> management
<i>Caloperdix oculea</i> Ferruginous wood-partridge	3	D	Malay Peninsula, Sumatra, Borneo	1,000-10,000	D	Hunting, Habitat loss	V	<i>In situ</i> management
<i>Haemotortyx sanguineiceps</i> Crimson-headed wood-partridge	-	A	Borneo	?1,000-10,000	D	Habitat loss	V	Survey, <i>In situ</i> management

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<i>Rollulus rouloul</i> Crested wood-partridge	-	D	Malay Peninsula, Sumatra, Borneo	1,000- 100,000	D	Habitat loss, Bird trade, Hunting	V	<i>In situ</i> management, Captive management
<i>Ptilopachus petrosus</i> Stone partridge	5	E	Sub-Saharan C Africa	>1,000,000	S	No threat	S	None needed at present
<i>Bambusicola fytchii</i> Mountain bamboo-partridge	2	B	India, China, Burma, Bangladesh, Thailand, Laos, Vietnam	1,000- 100,000	D	Hunting, Habitat loss	V	Survey
<i>Bambusicola thoracica</i> Chinese bamboo-partridge	2	C	Mainland China, Taiwan, (Japan, Hawaii)	?100,000- >1,000,000	S	Habitat loss	S	None needed at present
<i>Galloperdix spadicea</i> Red spurfowl	3	D	India, Nepal	?10,000- 100,000	S/D	No threat	S	None needed at present
<i>Galloperdix lunulata</i> Painted spurfowl	-	D	Peninsular India	?10,000- 100,000	S/D	Habitat loss	S	None needed at present
<i>Galloperdix bicalcarata</i> Ceylon spurfowl	-	Is	Sri Lanka	?1,000- 10,000	D	Habitat loss	V	Survey
<i>Ophrysia superciliosa</i> Indian mountain-quail	-	?A	India	?0-100	?Ext	Insufficient information	C/EX	Survey
NUMIDIDAE								
<i>Agelastes meleagrides</i> White-breasted guineafowl	-	C	Liberia, Ghana, Côté d'Ivoire, Sierra Leone	>58,000	D	Habitat loss, Hunting	V	Survey, <i>In situ</i> management
<i>Agelastes niger</i> Black guineafowl	-	D	Cameroon, Zaire, Gabon, Congo Republic	100,000- 500,000	?D	Habitat loss, Hunting	S	Survey, <i>In situ</i> management
<i>Numida meleagris</i> Helmeted guineafowl	9							
<i>N.m.see</i> ¹	8	E	Sub-Saharan Africa	>1,000,000	?S	No threat	S	None needed at present
<i>N.m.sabyi</i>	-	A	Morocco	0-100	D	Insufficient information	C	Survey, PHVA
<i>Guttera plumifera</i> Plumed guineafowl	2	D	Cameroon, Central African Republic, Zaire, Uganda, Gabon, Congo Republic	10,000- 100,000	?D	Habitat loss, Hunting	S	Survey, <i>In situ</i> management
<i>Guttera pucherani</i> Crested guineafowl	5	E	Sub-Saharan Africa	>100,000	?S	No threat	S	None needed at present
<i>Acryllium vulturinum</i> Vulturine guineafowl	-	E	Ethiopia, Somalia, Uganda, Kenya, Tanzania	>1,000,000	?S	No threat	S	None needed at present
ODONTOPHORIDAE								
<i>Dendrortyx barbatulus</i> Bearded tree-quail	-	A	Mexico	<1,000	D	Habitat loss, Hunting	C	Survey, Education
<i>Dendrortyx macroura</i> Long-tailed tree-quail	6	A	Mexico	20,000- 200,000	?D	Habitat loss	S	Survey

¹ = meleagris, galeata, somaliensis, reichenowi, mitrata, marungensis, damarensis, coronata.

SCIENTIFIC NAME ENGLISH NAME	Sub spp	AREA	RANGE COUNTRIES/ REGIONS / ISLANDS	POP ^N SIZE	POP ^N TREND	THREATS	M - L CAT.	FUTURE ACTIONS
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<i>Dendrotyx leucophrys</i> Buffy-crowned tree-quail	2	A	Chiapas, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica	20,000- 200,000	?D	Habitat loss	S	Survey
<i>Oreortyx pictus</i> Mountain quail	5	E	E North America	>1,000,000	S	Habitat loss	S	None needed at present
<i>Callipepla squamata</i> Scaled quail	4	E	S USA and N.Mexico	>1,000,000	D	Habitat loss	S	None needed at present
<i>Callipepla douglasii</i> Elegant quail	5	C	Mexico	50,000- 100,000	?S	?Habitat loss	S	None needed at present
<i>Callipepla californica</i> California quail	8	E	W USA, SW Canada, NW Mexico, (E USA, New Zealand, Hawaii, Chile, King Island)	>1,000,000	?S	Habitat loss	S	None needed at present
<i>Callipepla gambelii</i> Gambel's quail	7	E	SW USA and NW Mexico	>1,000,000	S	Habitat loss	S	None needed at present
<i>Philortyx fasciatus</i> Barred quail	-	A	Mexico	?<100,000	S	No threat	S	None needed at present
<i>Colinus virginianus</i> Northern bobwhite	22	E	USA, Canada, Mexico, Cuba, Guatemala	>20 million	D	Habitat loss, Pesticides	S	None needed at present
<i>Colinus nigrogularis</i> Black-throated bobwhite	4	A	Mexico, Guatemala, Belize, Honduras, Nicaragua.	100,000- 1,000,000	?S		S	Taxonomic clarification
<i>Colinus leucopogon</i> Spot-bellied bobwhite	6	A	Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala	<500,000	?S		S	Taxonomic clarification
<i>Colinus cristatus</i> Crested bobwhite	14	E	Costa Rica, Colombia, Venezuela, Guyana, Surinam, French Guiana	>1,000,000	S	?Habitat loss, Hunting	S	Taxonomic clarification, ?Sustainable use
<i>Odontophorus gujanensis</i> Marbled wood-quail	8	E	Costa Rica, Panama, Colombia, Venezuela, Guianas, Ecuador, Peru, Bolivia, Brazil, Surinam	>1,000,000	?D	Habitat loss, Hunting	S	None needed at present
<i>Odontophorus capueira</i> Spot-winged wood-quail	2	C	Brazil, Paraguay, NE Argentina, Uruguay	<50,000	D	Habitat loss, Hunting	S	Survey, <i>In situ</i> management
<i>Odontophorus melanotis</i> Black-eared wood-quail	2	B	Nicaragua, Costa Rica, Panama	< 50,000	D	Habitat loss, ?Hunting	V	Survey, Taxonomic clarification
<i>Odontophorus erythrops</i> Rufous-fronted wood-quail	2	B	Colombia, Ecuador, Honduras, Nicaragua, Costa Rica, Panama	<500,000	?D	?Habitat loss, ? Hunting	S	Survey, Taxonomic clarification
<i>Odontophorus atrifrons</i> Black-fronted wood-quail	3	A	Colombia, Venezuela	?<10,000	D	Habitat loss, ?Hunting.	V	Survey
<i>Odontophorus hyperythrus</i> Chestnut wood-quail	-	A	Colombia	<10,000	D	Habitat loss, ?Hunting	V	Survey, Taxonomic clarification
<i>Odontophorus melanonotus</i> Dark-backed wood-quail	-	A	Colombia, Ecuador	?<10,000	?	?Habitat loss ?Hunting	V	Survey, Taxonomic clarification
<i>Odontophorus speciosus</i> Rufous-breasted wood-quail	3	D	Ecuador, Peru, Bolivia	>500,000	?S	Insufficient information	S	Taxonomic clarification
<i>Odontophorus dialeucos</i> Tacarcuna wood-quail	-	A	Panama	< 50,000	?H	?Habitat loss	V	Survey, Taxonomic clarification

SCIENTIFIC NAME ENGLISH NAME	Sub spp	AREA	RANGE COUNTRIES/ REGIONS/ISLANDS	POP ^N SIZE	POP ^N TREND	THREATS	M - L CAT.	FUTURE ACTIONS
<i>Odontophorus strophium</i> Gorgeted wood-quail	-	A	Colombia	<2,500	D	Habitat loss, Hunting	E	<i>In situ</i> management, Survey.
<i>Odontophorus columbianus</i> Venezuelan wood-quail	-	A	Venezuela	?<10,000	D	Habitat loss, Hunting	V	Survey, <i>In situ</i> management, Taxonomic clarification
<i>Odontophorus leucolaemus</i> Black-breasted wood-quail	-	A	Costa Rica, Panama	< 50,000	?D	?Habitat loss	V	Survey
<i>Odontophorus balliviani</i> Stripe-faced wood-quail	-	A	Peru, Bolivia	< 50,000	?D	?Habitat loss, ?Hunting	V	Survey
<i>Odontophorus stellatus</i> Starred wood-quail	-	E	Ecuador, Peru, Bolivia, Amazonian Brazil	>750,000	?S	No threat	S	None needed at present
<i>Odontophorus guttatus</i> Spotted wood-quail	-	C	Mexico, Guatemala, Belize, Honduras, Nicaragua, Costa Rica, Panama	?<500,000	?D	?Habitat loss	S	None needed at present
<i>Dactylortyx thoracicus</i> Singing quail	17	C	Mexico, Guatemala, El Salvador, Honduras, Belize	100,000- 500,000	?S	Insufficient information	S	Survey
<i>Cyrtonyx montezumae</i> Montezuma quail	5	C	Mexico, S USA	>500,000	?S	Habitat loss	S	None needed at present
<i>Cyrtonyx ocellatus</i> Ocellated quail	-	A	Mexico, Guatemala, El Salvador, Honduras, Nicaragua	< 50,000	D	Habitat loss	V	Survey
<i>Rhynchortyx cinctus</i> Tawny-faced quail	3	D	Honduras, Nicaragua, Costa Rica, Panama, Colombia, Ecuador	<500,000	?D	Habitat loss, Hunting	S	Survey

3. Threatened taxon summaries

The previous chapter presents the basic information of conservation importance for all species and a number of subspecies of partridges, quails, francolins, snowcocks and guineafowl. The standard entry form in the table demonstrates that all taxa listed have been considered in the same detail, as far as available information allows.

In this chapter, a summary is given for all taxa that were not categorised as unequivocally safe from extinction (*i.e.* insufficiently known or threatened) according to the Mace-Lande (1991) criteria. These taxa are listed in table 3.1. Each summary presents the information based upon which each taxon was assigned a threat category and, therefore, expands on the species entries in the table given in the last chapter. These summaries are grouped on a regional basis. For each taxon, the following information is provided:

1. Conservation status - gives the threat category assigned during the Conservation Assessment exercise and its listing according to the Convention on Trade in Endangered Species (CITES).
2. Taxonomic status - gives an indication of how distinct the taxon is, by indicating whether the taxon is a species with no, few or many subspecies or a subspecies-group. Where there is disagreement over the classification of the taxon, this is indicated.
3. Current distribution - gives the geographic distribution of the taxon and the habitat in which it is known to occur. Any protected areas from which the taxon has been

recorded are also listed and, if the species is a Restricted Range Species (*sensu* ICBP 1992), this is mentioned, together with the Endemic Bird Area that the species inhabits and its conservation priority rating. The identification of Endemic Bird Areas and their global distribution is presented in ICBP (1992).

4. Population status - gives any published data on population figures. For those taxa for which there has been no detailed fieldwork upon which to base estimates of population size, estimates were made during the Conservation Assessment Workshop. Unless otherwise stated these estimates are based upon information relating to density (*e.g.* frequency of encounters) and knowledge of the distribution of available habitat. Information on the numbers of specimens of the taxon known to be in captivity are also given. Information sources are the ISIS register and the WPA captive census.

5. Threats - includes identified threats and those implied from, for example, knowledge of habitat loss within the taxon's range, or widespread hunting of ground-dwelling birds.

6. Future action - the recommendations of the Conservation Assessment Workshop participants based on the proposals of the national and regional authorities who provided source information. Regional contributors then revised these recommendations (see the Acknowledgements for a complete list).

Table 3.1. Threatened Partridges, Quails, Francolins, Snowcocks and Guineafowl based on Mace-Lande categories.

Critical/Extinct

Indian mountain-quail

Ophrysia superciliosa

Critical

Manipur bush-quail

Sichuan hill-partridge

Scaly-breasted hill-partridge (Sumatran subsp.)

Helmeted guineafowl (Moroccan subsp.)

Bearded tree-quail

Perdica manipurens

Arborophila rufipectus

A. charltonii atjenensis

Numida meleagris sabyi

Dendrortyx barbatus

Endangered

Double-spurred francolin (Moroccan subsp.)

Djibouti francolin

Collard hill-partridge

Orange-necked hill-partridge

Chestnut-headed hill-partridge (Thai subsp.)

Francolinus bicalcaratus ayesha

F. ochropectus

Arborophila gingica

A. davidi

A. cambodiana diversa

White-eared (Hainan) hill-partridge
 Annamese hill-partridge
 Scaly-breasted hill-partridge (Bornean subsp.)
 Scaly-breasted hill-partridge (Malaysian subsp.)
 Gorgeted wood-quail

Vulnerable

Caspian snowcock
 Painted francolin (Sri Lankan subsp.)
 Swamp francolin
 Cameroon mountain francolin
 Swierstra's francolin
 Long-billed wood-partridge
 Madagascar partridge
 Black wood-partridge
 Udzungwa forest partridge
 White-throated (Taiwan) hill-partridge
 Red-breasted hill-partridge
 Brown-breasted hill-partridge
 (Vietnamese subsp. cluster)
 Bare-throated hill-partridge (Javan subsp.)
 Bare-throated hill-partridge
 (Malaysian and Sumatran subsp. cluster)
 Javan hill-partridge
 Chestnut-headed hill-partridge (Cambodian subsp.)
 Red-billed hill-partridge
 Borneo hill-partridge
 Ferruginous wood-partridge
 Crimson-headed wood-partridge
 Crested wood-partridge
 Mountain bamboo-partridge
 Ceylon spurfowl
 White-breasted guineafowl
 Black-eared wood-quail
 Black-fronted wood-quail
 Chestnut wood-quail
 Dark-backed wood-quail
 Tacarcuna wood-quail
 Venezuelan wood-quail
 Black-breasted wood-quail
 Stripe-faced wood-quail
 Ocellated quail

Insufficient Information

See-see partridge
 Verreaux's monal-partridge
 Szechenyi's monal-partridge
 Schlegel's banded francolin
 Grey-striped francolin
 Nahan's forest francolin

A. ardens
A. merlini
A. charltonii graydoni
A. c. charltonii
Odontophorus strophium

Tetraogallus caspius
Francolinus pictus watsoni
Francolinus gularis
F. camerunensis
F. swierstrai
Rhizothera longirostris
Margaroperdix madagarensis
Melanoperdix nigra
Xenoperdix udzungwensis
Arborophila crudigularis
A. mandellii
A. brunneopectus henrici/albigula

A. orientalis orientalis
A. o. campbelli/rolli/sumatrana

A. javanica
A. cambodiana cambodiana
A. rubrirostris
A. hyperythra
Caloperdix oculea
Haematortyx sanguiniceps
Rollulus rouloul
Bambusicola fytchii
Galloperdix bicalcarata
Agelastes meleagrides
Odontophorus melanotis
O. atrifrons
O. hyperythrus
O. melanonotus
O. dialeucos
O. columbianus
O. leucolaemus
O. balliviani
Cyrtonyx ocellatus

Ammoperdix griseogularis
Tetraophasis obscurus
T. szechenyii
Francolinus schlegelii
F. griseostriatus
F. nahani

3.1. Americas

3.1.1. Bearded tree-quail *Dendrortyx barbatus*

Conservation status: Mace-Lande - critical; CITES - Not listed

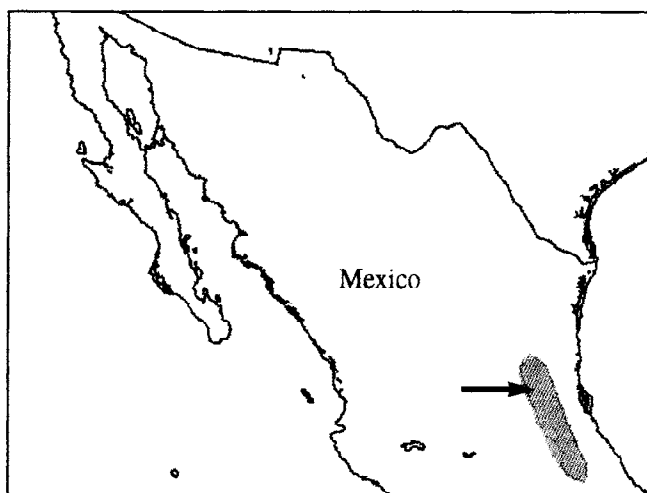
Taxonomic status: A monotypic species.

Current distribution: Cloud forests of eastern Mexico, where it inhabits humid montane, subtropical and possibly temperate forests at 1,200-2,200 m elevation. This is a Restricted Range Species, occurring in Endemic Bird Area a07 which is not a highlighted Endemic Bird Area (ICBP, unpub. data). See Collar *et al.* (1992) for a detailed description of the distribution.

Population status: Unknown, but there are likely to be less than 1,000 in disjunct populations. Two populations are likely to comprise fewer than 250 individuals each. There are no specimens known in captivity.

Threats: Rampant destruction of primary forests in its range and loss of habitat in areas formerly known to be occupied has been documented (Collar *et al.* 1992 Howell & Webb 1992). The species is subject to subsistence hunting.

Future action: Habitat protection and a hunting ban are needed, at least until the results of a survey are known. Research should concentrate on identifying suitable habitat and determining presence or absence of the species followed by assessments of population densities. The species is a candidate for a Population and Habitat Viability Assessment, once the above information is collected. Collar *et al.* (1992) outline research and management strategies for this species. See project 4.2.3.



Distribution of bearded tree-quail

3.1.2. Black-eared wood-quail *Odontophorus melanotis*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: Two subspecies. Possibly conspecific with one or more of the 'rusty-breast' species of *Odontophorus* (*O. hyperythrus*, *O. speciosus* and *O. melanonotus*).

Current distribution: Found in tropical and lower subtropical forest in eastern Central America from Honduras to Panama at 450-1,600 m elevation. This is not a Restricted Range Species, but it probably occurs in Southern Central American Caribbean Slope (A16) and North Choco and Darien Lowlands (A19) Endemic Bird Areas. These Endemic Bird Areas have a protected area coverage of 0-5% and 20-30% respectively, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category II and category III respectively (ICBP 1992). Subspecies in Honduras are considered to be uncommon (Monroe 1968).

Population status: Unknown, but thought to be less than 50,000. There are no specimens in captivity.

Threats: Severe deforestation.

Future action: Estimate densities in more than three areas as part of the *Odontophorus* monitoring plan (see project 4.2.2.).

3.1.3. Black-fronted wood-quail *Odontophorus atrifrons*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A polytypic species, containing three subspecies. Possibly conspecific with one or more of the 'black-throat' species of *Odontophorus* (*O. strophium*, *O. columbianus*, *O. leucolaemus* and *O. dialeucos*).

Current distribution: Restricted range inhabiting subtropical montane forests in northeast Colombia and northwest Venezuela at 1,200-3,000 m elevation. This is a Restricted Range Species and is found in the Santa Marta Mountain (B08) and the Eastern Andes (B10) Endemic Bird Areas. These Endemic Bird Areas have protected area coverage of 60-70% and 5-10% respectively, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category II (ICBP 1992). The nominate race is secure in a large

protected area. *O. a. navai* is protected in Sierra de Perija National Park.

Population status: Unknown, but likely to be less than 10,000 in three sub-populations. There are no specimens in captivity.

Threats: Two sub-populations, *O. a. variegatus* and *O. a. navai*, occur outside the Santa Marta Mountains in areas subject to heavy deforestation. The range in some areas of Venezuela is subject to loss of habitat as a result of increased mineral extraction.

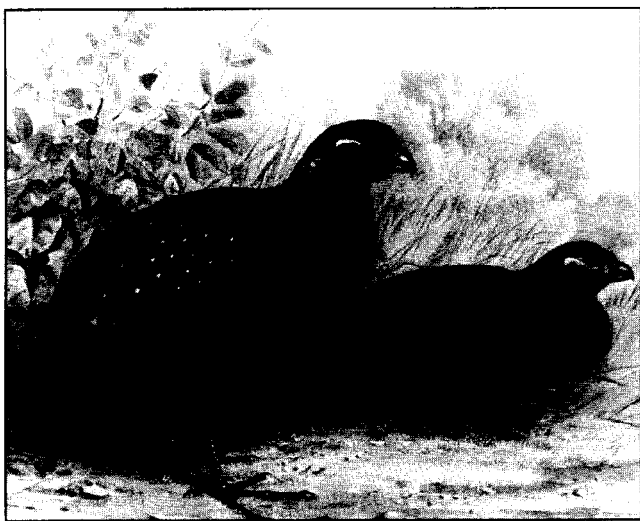
Future action: Subject to human safety concerns, assessment of the remaining forest cover in the Eastern Andes is needed as well as determination of species presence. For the nominate race, estimates of population densities are needed as part of the *Odontophorus* monitoring plan (see project 4.2.2.).

3.1.4. Chestnut wood-quail *Odontophorus hyperythrus*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: Possibly conspecific with one or more 'rusty-breast' species of *Odontophorus* (*O. melanotis*, *O. speciosus* and *O. melanonotus*).

Current distribution: Found in humid montane forest and dense borders in secondary growth in the Western and Central Andes of Colombia at 1,600-2,700 m elevation. This is a Restricted Range Species and is found in the Cauca



Chestnut wood-quail

Artist: Henry Jones

Valley (B12), Magdalena Valley (B13) and Western Andes of Colombia and Ecuador (B15) Endemic Bird Areas. The last of these has a protected area coverage of 10-15%, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category II, category II and category I respectively (ICBP 1992). This species is common in Muciche National Park.

Population status: Unknown, but likely to be less than 10,000 in 3 sub-populations. There are no specimens in captivity.

Threats: The habitat is subject to high rates of deforestation in the Central Andes, and there is evidence of hunting pressure (Negret 1991).

Future action: Estimate population densities in more than three known localities as part of *Odontophorus* monitoring plan (see project 4.2.2.).

3.1.5. Dark-backed wood-quail *Odontophorus melanonotus*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: Possibly conspecific with one or more 'rusty-breast' species of *Odontophorus* (*O. hyperythrus*, *O. speciosus* and *O. melanotis*).

Current distribution: Restricted range species found in the lower subtropical forest zone in southwest Colombia and northwest Ecuador at 1,200-1,500 m elevation. This is a Restricted Range Species, endemic to the Western Andes of Colombia and Ecuador (B15). This Endemic Bird Area has a protected area coverage of 10-15%, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category I (ICBP, 1992).

Population status: Unknown, but might be less than 10,000 with a small distribution. However, it is common at La Planada, Colombia (Gary Stiles *in litt.*). There are no specimens in captivity.

Threat: Deforestation.

Future action: Estimate densities in both Colombia and Ecuador as part of the *Odontophorus* monitoring plan (see project 4.2.2.).

3.1.6. Tacarcuna wood-quail *Odontophorus dialeucos*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: Possibly conspecific with one or more of the 'black-throat' species of *Odontophorus* (*O. strophium*, *O. columbianus*, *O. leucolaemus* or *O. atrifrons*).

Current distribution: Restricted Range Species found in subtropical forest in eastern Panama and extreme northern Colombia at 1,200-1,400 m elevation including the Darien Highlands (A20). This Endemic Bird Area has a protected area coverage of 20-30%, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category II (ICBP 1992). See Ridgely & Gwynne (1989).

Population status: Unknown, but thought to be less than 50,000. There are no specimens in captivity.

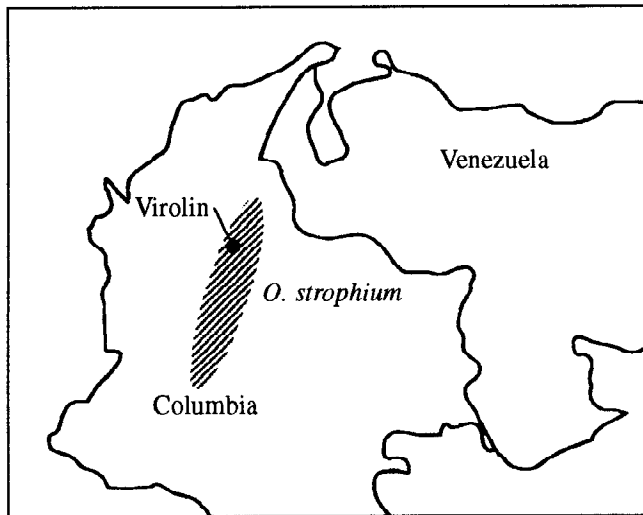
Threats: Deforestation.

Future action: Estimate densities in more than three areas as part of the *Odontophorus* monitoring plan (see project 4.2.2.).

3.1.7. Gorgeted wood-quail *Odontophorus strophium*

Conservation status: Mace-Lande - endangered; CITES - Not listed

Taxonomic status: Possibly conspecific with one or more of the 'black-throat' species of *Odontophorus* (*O. atrifrons*, *O. columbianus*, *O. leucolaemus* and *O. dialeucos*).



Distribution of gorgeted wood-quail

Current distribution: Endemic to temperate and subtropical forests in a small area of the western slope of the Eastern Andes (see Collar *et al.* 1992). This is a Restricted Range Species and is endemic to the Eastern Andes of Colombia Endemic Bird Area (B10). This Endemic Bird Area has a protected area coverage of 5-10%, including the Cachalu Wildlife Sanctuary, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category II (ICBP 1992).

Population status: Unknown, but likely to be less than 2,500 and known to persist at only one site. There are no specimens in captivity.

Threats: Forests now largely cleared and the species is known to occur in only one sizeable forest block in the range. Hunting may threaten other relic populations.

Future action: Protect additional forest outside Cachalu Wildlife Sanctuary. Identify remnant forest and determine presence or absence of the species followed by an assessment of population size. Conduct a Population and Habitat Viability Assessment once sufficient information has been collected (see project 4.2.4.).

3.1.8. Venezuelan wood-quail *Odontophorus columbianus*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: Possibly conspecific with one or more of the 'black-throat' species of *Odontophorus* (*O. strophium*, *O. atrifrons*, *O. leucolaemus* and *O. dialeucos*).

Current distribution: Endemic to subtropical forests in northern and western Venezuela at 800-1,200 m elevation. This is a Restricted Range Species found in the Northern Venezuela Mountains (B04) and Mérida Mountains (B06) Endemic Bird Areas. The former Endemic Bird Area has a protected area coverage of 10-30%, although this does not necessarily apply to the required habitat of this species. Both Endemic Bird Areas have priority status II (ICBP 1992).

Population status: Unknown, but the population could be less than 10,000. There has been some research on breeding biology (Schwartz and Lentino 1984). Very few individuals were observed in 750 km of cracid transects (Stuart Strahl, *in litt.*). It may be common in Henri Pittier National Park. There are no specimens in captivity.

Threats: Although part of the population is found in a large protected area (Henri Pittier National Park) much of the range is threatened by deforestation and urbanization.

Future action: Estimate densities in several locations, including Henri Pittier National Park as part of the *Odontophorus* monitoring plan (see project 4.2.2.).

3.1.9. Black-breasted wood-quail *Odontophorus leucolaemus*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

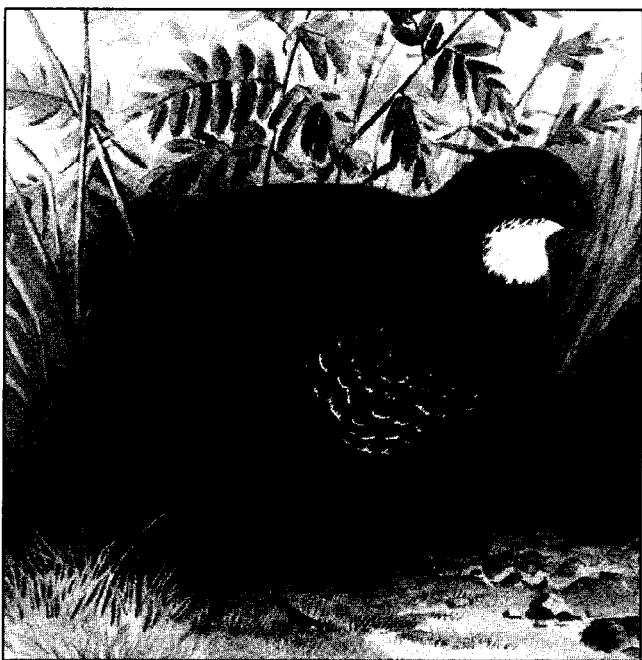
Taxonomic status: A monotypic species. Possibly conspecific with one or more of the 'black-throat' species of *Odontophorus* (*O. strophium*, *O. columbianus*, *O. atrifrons*, and *O. dialeucos*).

Current distribution: Tropical and subtropical forests of Costa Rica and western Panama at 1,350-1,600 m elevation. This is a Restricted Range Species found in the Costa Rican and Panamanian Highlands (A18) Endemic Bird Area. This Endemic Bird Area has a protected area coverage of 10-15%, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category II (ICBP 1992).

Population status: Unknown, but thought to be less than 50,000. See Ridgely & Gwynne (1989). There are no specimens in captivity.

Threats: Deforestation and loss of habitat to agriculture.

Future action: Estimate densities in more than three areas as part of the *Odontophorus* monitoring plan (see project 4.2.2.).



Black-breasted wood-quail

Artist: Henry Jones

3.1.10. Stripe-faced wood-quail *Odontophorus balliviani*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A monotypic species.

Current distribution: Humid montane forests, including stunted cloud-forest, clearings and boggy meadows in eastern Andes of southeastern Peru and northwestern Bolivia at 2,000-3,000 m elevation. This is a Restricted Range Species found in the Bolivian Andes (B35) and Upper Yungas (B33) Endemic Bird Areas. These Endemic Bird Areas have a protected area coverage of 0-5%, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category II and category III respectively (ICBP 1992).

Population status: Unknown, but thought to be less than 50,000. See Johnsgard (1988) and Fjelds  and Krabbe (1990). There are no specimens in captivity.

Threats: Possibly deforestation and loss of habitat to urbanization and agriculture.

Future action: Extremely poorly known species for which locality data is required. Estimate densities in more than three areas as part of the *Odontophorus* monitoring plan (see project 4.2.2.).

3.1.11. Ocellated quail *Cyrtonyx ocellatus*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A monotypic species.

Current distribution: Open pine-oak woodland and brushy fields from Mexico south through eastern Guatemala, El Salvador, Honduras, to northern Nicaragua at 750-3,000 m elevation. This is a Restricted Range Species that may occur in the Northern Central American Highlands (A14) Endemic Bird Area. This Endemic Bird Area has a protected area coverage of 0-5%, although this does not necessarily apply to the required habitat of this species. The Endemic Bird Area Priority Status is category II (ICBP 1992).

Population status: Unknown, but thought to be less than 50,000. See Monroe (1968) and Land (1970). There are no specimens in captivity.

Threats: Deforestation and habitat degradation may be threats.

Future action: Efforts should be made to obtain good population density data from suitable habitat (see project 4.2.1.).

3.2. Africa

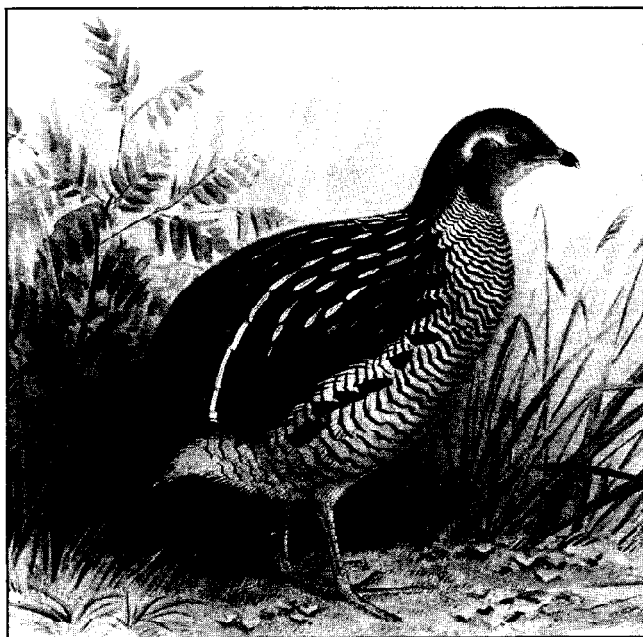
3.2.1. Schlegel's banded francolin *Fringilla schlegelii*

Conservation status: Mace-Lande - insufficient information; CITES - Not listed

Taxonomic status: Forms a superspecies with *F. coqui* and *F. albogularis* (Crowe *et al.* 1986). In partitioning the genus *Fringilla*, Crowe *et al.* (1992) place this species in the subgenus *Peliperdix* along with *coqui*, *albogularis* and *lathamii*.

Current distribution: An endemic resident from the Adamawa Plateau in west-central Cameroon through northern Central African Republic and southern Chad to south-west Sudan. It occurs in well grassed wooded savannahs in close association with the 'Ka' tree *Isoberinia doka* (Crowe *et al.* 1986).

Population status: A very poorly known species. No surveys have been conducted, but it is generally regarded as uncommon to rare and local (Crowe *et al.* 1986). There are no specimens in captivity.



Schlegel's banded francolin

Artist: Henry Jones

Threats: Not known.

Future action: Extensive surveys are required throughout the species' range. It may prove necessary to manage the savannah habitat in some areas.

3.2.2. Grey-striped francolin *Fringilla griseostriatus*

Conservation status: Mace-Lande - insufficient information; CITES - Not listed

Taxonomic status: Monotypic. Forms a superspecies with *F. squamatus* and *F. achantensis* (Crowe *et al.* 1986). In partitioning the genus *Fringilla*, Crowe *et al.* (1992) place this species in a new subgenus *Squamatoconus* within the genus *Pternistis*, along with *squamatus* and *ahantensis*.

Current distribution: Western Angola where it is an endemic resident in the escarpment zone (Crowe *et al.* 1986). There are believed to be two isolated populations, one occurring in South Cuanza, West Milange and one on the escarpment in South Benguela District and extreme North-east Huila District (Crowe *et al.* 1986). Its population status is unknown and it has not been recorded since 1954. It is a Restricted Range Species, occurring in Endemic Bird Area C08 which is Angola and is a Priority II Endemic Bird Area (ICBP 1992).

Population status: Not seen since 1954. There are no specimens in captivity.

Threats: None described due to lack of information, but possibly forest destruction (Crowe *et al.* 1986). Its range is currently within a war zone.

Future action: Extensive survey is urgently needed to assess status and recommend future actions (see project 4.3.4.).

3.2.3. Nahan's forest francolin *Fringilla nahani*

Conservation status: Mace-Lande - insufficient information; CITES - Not listed

Taxonomic status: Monotypic (Crowe *et al.* 1986). In partitioning the genus *Fringilla*, Crowe *et al.* (1992) place this species in the monotypic subgenus *Acentrotyx* within the genus *Pternistis*.

Current distribution: Endemic resident in north-east Zaire (between Aruwimi, Nepoko and Semliki Rivers) and West and South Uganda (Budongo, Bugoma and Mabira Forests) where it is locally distributed and rare (Collar and Stuart 1985). Inhabits forest from 1000-1400 m (Crowe *et al.* 1986). In Uganda, it is present in Bugoma Forest Reserve (365 square kilometres), Kibale Forest Reserve (560 square kilometres) and Mabira Forest Reserves (306 square kilometres) (Derek Pomeroy *in litt.*). Also, the population in the Semliki Valley is within the Virunga National Park and would be best protected if the Park were to be extended to include the East Ituri Forest (Collar and Stuart 1985; Crowe *et al.* 1986).

Population status: Very poorly known with little recent information. Presumed declining from loss of habitat. There are no specimens in captivity.

Threats: Loss of tree cover for timber production and over-exploitation for food (Crowe *et al.* 1986) are possible threats.

Future action: An extensive survey is needed to assess its status in Uganda, including Bugoma, Kibale and Mabira Forest Reserves, and in Zaire (see project 4.3.1.). Also, an extension of East Ituri as a protected area would help to conserve the species.

3.2.4. Double-spurred francolin (Moroccan subspecies) *Francolinus bicalcaratus ayesha*

Conservation status: Mace-Lande - endangered; CITES - Not listed

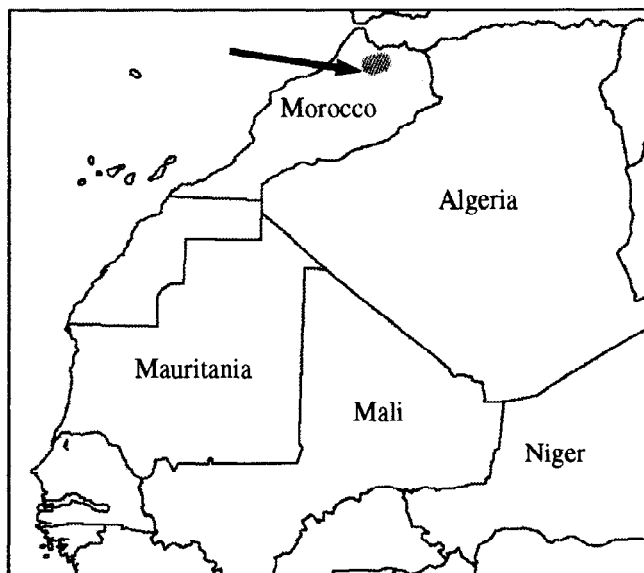
Taxonomic status: It is one of two accepted subspecies that is regarded by Crowe *et al.* (1986) as forming a superspecies with *F. clappertoni*, *F. icterorhynchus* and *F. harwoodi*. In partitioning the genus *Francolinus*, Crowe *et al.* (1992) place this species in the subgenus *Chaetopus* within the genus *Pternistis*, along with *icterorhynchus*, *clappertoni* and *harwoodi*.

Current distribution: Morocco, where it is found in cork-oak forests (Nadia de la Perche *in litt.*). This subspecies has a restricted distribution that is disjunct from that of the widespread *F. b. bicalcaratus* (Crowe *et al.* 1986). Only one definite and one possible location are known - Sidi Bettache and Moulay Bouazza respectively (Nadia de la Perche *in litt.*). Heinze and Krott (1979) heard birds calling at the former locality only, despite intensive searches in the Mamora Forest as well. It does occur in Sidi Bettache, a protected area (Nadia de la Perche *in litt.*).

Population status: There were no more than a few hundred individuals in 1988, but the population is believed to have increased in numbers between 1982 and 1988 (Nadia de la Perche *in litt.*). Current status unknown (Crowe *et al.* 1986; Nadia de la Perche *in litt.*). There are a few specimens in captivity in Morocco where successful captive breeding was achieved in 1989 (de la Perche 1992). ISIS and the WPA census do not record any birds.

Threats: Habitat degradation and over-exploitation for food.

Future action: Clarify taxonomic status. Research to identify habitat requirements and management options plus continued population monitoring. Survey of other possible areas for protection. See project 4.3.5.



Distribution of double-spurred francolin in Morocco

3.2.5. Cameroon Mountain francolin *Francolinus camerunensis*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: Monotypic. With *F. swierstrai* comprises a superspecies (Crowe *et al.* 1986). In partitioning the genus *Francolinus*, Crowe *et al.* (1992) placed this species in a new subgenus *Oreocolinus* within the genus *Pternistis*, along with *jacksoni*, *nobilis*, *swierstrai*, *castaneicollis*, *erckelli* and *ochropectus*.

Current distribution: Restricted to 200 square kilometres (Crowe *et al.* 1986) on south-east and north-east slopes of Mount Cameroon, where it inhabits primary and secondary montane forest between 850 and 2100 m (Gary Allport *in litt.*; Collar and Stuart 1985). The type specimen, however,

was collected at 2300 m (Crowe *et al.* 1986). Mount Cameroon is a protected area. A Restricted Range Species, occurring in Endemic Bird Area C04 which is the Cameroon mountains and is a Priority I Endemic Bird Area (ICBP 1992).

Population status: Said to be locally common (Crowe *et al.* 1986), especially on the southern slopes of the mountain (Gary Allport *in litt.*). No evidence of a marked population decline. ISIS and the WPA census do not record any birds in captivity.

Threats: Risk of volcanic destruction of habitat in its small range, as happened in 1982 when a large area of suitable habitat was destroyed. Possibly over-harvested for food (Crowe *et al.* 1986).

Future action: Extensive survey to diagnose requirements and possible methods of habitat protection (see project 4.3.6.).

3.2.6. Swierstra's francolin *Francolinus swierstrai*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: Monotypic. With *camerunensis*, comprises a superspecies (Crowe *et al.* 1986). In partitioning the genus *Francolinus*, Crowe *et al.* (1992) place this species in a new subgenus *Oreocolinus* within the genus *Pternistis*, along with *jacksoni*, *nobilis*, *camerunensis*, *castaneicollis*, *erckelli* and *ochropectus*.

Current distribution: Central Angola, where it is an endemic resident in the woodlands and forests of the highlands, especially where there are thick clumps in gullies and on cliffs. Probably restricted to a few relict patches of forest a few square kilometres in extent (Crowe *et al.* 1986). A Restricted Range Species, occurring in Endemic Bird Area C08, which is Angola and is a Priority II Endemic Bird Area (ICBP 1992).

Population status: It has a small range and is apparently rare within it. A few remnant forest blocks still persist, for example, on Mount Moco and Mount Soque (Crowe *et al.* 1986). Probably declining in view of habitat destruction (Collar and Stuart 1985). ISIS and the WPA census do not record any birds in captivity.

Threats: Forest destruction (Crowe *et al.* 1986). Its range is currently within a war zone.

Future action: Some conservation is apparently underway (Crowe *et al.* 1986), but no details are given. An extensive

survey is needed to identify status, threats and propose actions for habitat protection (see project 4.3.4.).

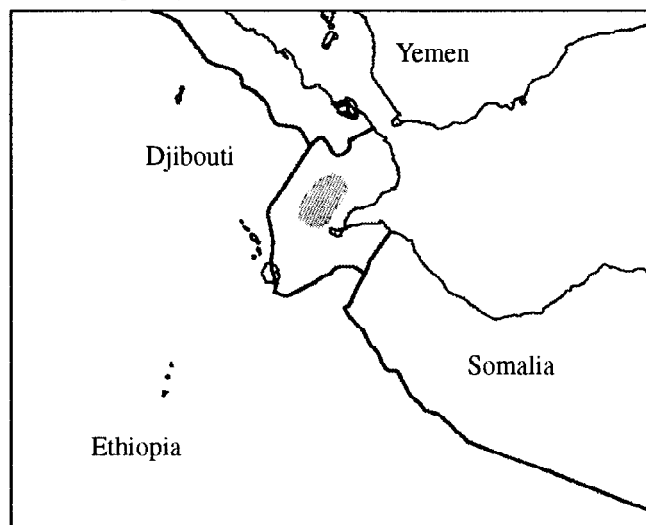
3.2.7. Djibouti francolin *Francolinus ochropectus*

Conservation status: Mace-Lande - endangered; CITES - Not listed

Taxonomic status: Monotypic. Forms a superspecies with *F. erckelli*, *F. castaneicollis*, *F. jacksoni* and *F. nobilis* (Crowe *et al.* 1986). In partitioning the genus *Francolinus*, Crowe *et al.* (1992) place this species in a new subgenus *Oreocolinus* within the genus *Pternistis*, along with *jacksoni*, *nobilis*, *camerunensis*, *swierstrai*, *castaneicollis* and *erckelli*.

Current distribution: Very limited range in the Forêt du Day in the Goda Mountains and in the Mabila Mountains of Djibouti. 35 square kilometres of habitat are known at two sites and there is a slender possibility of it occurring elsewhere (Geoff and Hilary Welch *in litt.*). Found in primary and secondary forest (mainly *Juniperus procera*, *Buxus hildebrandtii*, *Ficus* sp, *Acacia seyal* and *A. etbaica*) areas above 700 m. The Forêt du Day National Park (about 100 square kilometres) is a protected area. A Restricted Range Species, occurring in Endemic Bird Area c18 which is not a highlighted Endemic Bird Area (ICBP unpub. data).

Population status: There are currently less than 1,000 birds, though there were possibly over 5,000 in 1978 (Blot 1985) and so a decline is inferred. Its main site is the Forêt du Day which is now about 14 -15 square kilometres in extent (Geoff and Hilary Welch *in litt.*). The amount of available habitat was halved between 1977 and 1983 (Crowe *et al.* 1986). ISIS and the WPA census do not record any birds in captivity.



Distribution of the Djibouti francolin

Threats: Habitat degradation from grazing and collection of firewood (Crowe *et al.* 1986), and direct over-exploitation. Eggs and some birds are taken for food. The extent of this is unknown but likely to be a significant controlling factor in breeding success (Collar & Stuart 1985). Habitat fragmentation could lead to genetic isolation of sub-populations and inbreeding depression. Civil war in Djibouti for the last two years has led to a shift in human populations to the mountain areas which is likely to put considerable extra pressure on the francolin.

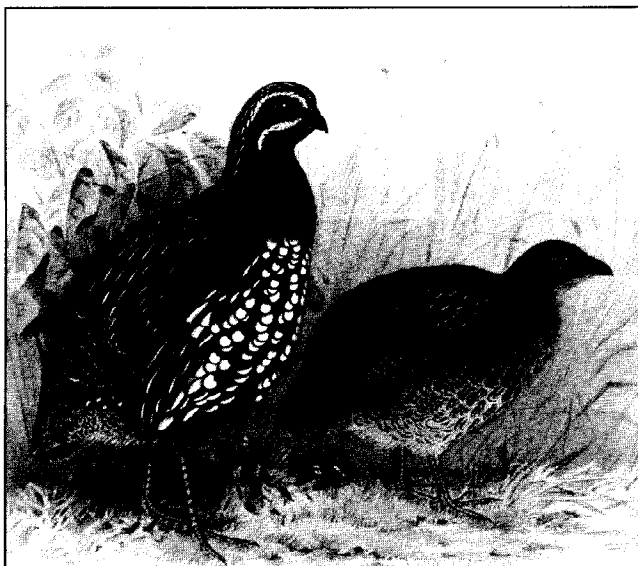
Future action: A protected area on the Mabila Mountain is required with appropriate management arrangements, education *etc.* and protection of the existing Forêt du Day protected area should be strengthened. An extensive survey of all known and possible localities in the range should be conducted to try to assess exact numbers. Research into ecological requirements to guide management strategies is required and a Population and Habitat Viability Assessment is definitely needed. See project 4.3.2.

3.2.8. Madagascar partridge *Margaroperdix madagarensis*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A monotypic genus.

Current distribution: Endemic to Madagascar where it is found in brushland in all but the driest areas of the island including the rainforest, deciduous forest and sub-desert zones between sea level and 1700 m. The brushland is



Madagascar partridge

Artist: Henry Jones

mostly secondary throughout the island except in the sub-desert (Mike Evans *in litt.*). A full locality list is given in Dee (1986). It has been introduced to Réunion. It occurs in a number of protected areas including both of Madagascar's National Parks (combined area 997 square kilometres), six out of eleven Reserve Naturelle Integrales (combined area 2,982 square kilometres) and five out of sixteen Reserve Speciales (combined area 287 square kilometres). Seven other Reserve Speciales have not been surveyed. There is, therefore, potentially 4,266 square kilometres of protected area in 13 blocks which may be suitable for the species. Also recorded in 8 out of 18 Sites of Biological Interest which were proposed as additions to the protected area network (Nicoll and Langrand 1989).

Population status: Apparently much declined since the 1930s (anecdotal evidence only - *e.g.* Langrand 1990) and could be decidedly scarce and more seriously reduced than appreciated. Was formerly common in the east and centre regions of the island (Rand 1936), but is no longer common according to one observer's experience based on five month's fieldwork in this region (Mike Evans *in litt.*). A population estimate of 10,000-100,000 is based only on range size and comments on abundance. ISIS records 0 individuals and the WPA census, 80 in captivity. Robbins (*in litt.*) has estimated 250 in captivity.

Threats: Habitat degradation through the conversion of brushland to grassland caused by annual burning (part of livestock grazing management). It is intensively hunted with dogs and is caught using rice-baited snares.

Future action: Further consultation within Madagascar is needed, possibly leading to an extensive survey which could fit in with the Madagascar Atlas currently in progress (contact Olivier Langrand, WWF, Antananarivo). Also required is research on the impact of subsistence hunting and whether steps can be taken to improve its management. It may be possible to investigate population changes associated with degradation of the brushland habitat and this may be a suitable M.Sc. project (see project 4.3.7.). The captive population should be properly maintained.

3.2.9. Udzungwa forest partridge *Xenoperdix udzungwensis*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: First discovered in July 1991 and fully described in Dinesen *et al.* (1994).

Current distribution: Discovered during the first phase of fieldwork undertaken as part of a project to identify areas of vertebrate endemism in the Eastern Arc Mountains of

Tanzania. The project is led by Jon Fjeldså of the Zoological Museum of Copenhagen and the field survey team comprised Lars Dinesen, Louis Hansen, Thomas Lehmborg and Jens Otto Svendsen. It occurs in two areas within the Udzungwa Mountains - Ndundulu Mountains (westernmost part of a forest covering 240 square kilometres) and Nyumbanitu Mountains (55 square kilometres) in montane and sub-montane primary evergreen forest between 1350 and 1900 m. It has not been recorded in the well-studied Mwanihana or Udzungwa scarp forests to the west, therefore the total known range is less than 300 square kilometres (Dinesen *et al.* 1994). The area where it does occur includes the West Kilombero Scarp Forest Reserve. Part of this Forest Reserve is now within the Udzungwa Mountains National Park which was gazetted in February 1992. Neither Ndundulu nor Nyumbanitu Mountains were included, however. Ndundulu is about five kilometres from the National Park border but is continuous with the Luhombero Forest, the eastern part of which is inside the Park. The area between Ndundulu and the National Park has yet to be surveyed, as is the rest of the Luhombero Forest east of the Ndundulus. Some of the forest in the Udzungwa Mountains National Park is not used by the species and there are also large grassland areas. Discovered after the completion of the Biodiversity Project, this species does have a restricted range and must occur within the Eastern Arc Mountains which is Endemic Bird Area C24 and Priority I (ICBP 1992). The altitude limits of the Endemic Bird Area are 750-3000 m and the species has been found between 1350 and 1900 m (Dinesen *et al.* 1994).

Population status: Flocks of up to eight were recorded and a total of 246 individuals were seen in 85 encounters during five-and-a-half months fieldwork in 1991/2 (Dinesen *et al.* 1994). There are no specimens in captivity.

Threats: None yet known, although the very small distribution makes the species vulnerable to any change in habitat use.

Future action: Maintain the protection of two areas - preferably by inclusion in Udzungwa Mountains National Park. The area includes a number of other IUCN Red List species. Because inclusion within the National Park will not seriously affect the villages of Udekwa and Ikula this step should be taken as a matter of urgency. An extensive survey of the entire forest blocks around Mt. Luhombero and Nyumbanitu should be conducted to assess the total distribution of the species within these forested areas. Subsequently, other forests, such as the nearby Matundu, should be surveyed. Given that the species is believed to be most closely related to the south-east Asian genus *Arborophila*, a further assessment of taxonomy is desirable using DNA techniques. See project 4.3.3. for more details.

3.2.10. White-breasted guineafowl *Agelastes meleagrides*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: Monotypic.

Current distribution: Based on several surveys in the late 1980s, it is known to occur in Sierra Leone, Ghana, Liberia, Côte d'Ivoire and possibly Guinea (Allport 1991) in primary and occasionally secondary lowland rainforest with a dry floor and closed canopy (Allport 1991; Francis *et al.* 1992). It is known from the following protected areas: Gola Forest Reserve in Sierra Leone (Allport *et al.* 1989); Nimba and Sapo National Parks in Liberia (Allport 1991); Tai National Park in Côte d'Ivoire (340 square kilometres - Francis *et al.* 1992); and formerly from Nini-Suhien National Park, Ankasa Game Reserve, Tano-Anwai and Boin-Tano Forest Reserves in Ghana (Gary Allport, *in litt.*). However, it has not been recorded in Ghana since 1963 (Collar and Stuart 1985).

Population status: About 50,000 known and possibly more. Côte d'Ivoire appears to be the species' stronghold, with 30-40,000 individuals in the Tai National Park in Côte d'Ivoire (Francis *et al.* 1992). Allport (1991) estimates 7,100 for the Gola forest in Sierra Leone. These two areas are the only ones where healthy populations still exist. It is very sensitive to hunting and only occurs abundantly in areas which are free of hunting (Allport 1991). ISIS and the WPA census record no specimens in captivity.



White-breasted guineafowl

Artist: Weick

Threats: Hunting and habitat loss (Gary Allport *in litt.*; Collar and Stuart 1985).

Future action: Extensive surveys, especially in Liberia, to identify other areas that may be designated as protected areas. Existing protected areas should be monitored, habitat destruction prevented and hunting controlled or prevented. See project 4.3.8.

3.2.11. Helmeted guineafowl (Moroccan subspecies) *Numida meleagris sabyi*

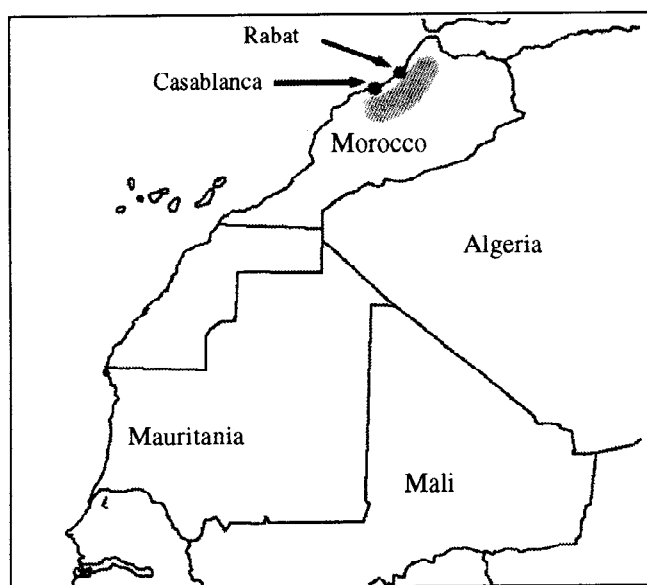
Conservation status: Mace-Lande - critical; CITES - Not listed

Taxonomic status: One of 9 subspecies accepted by Crowe *et al.* (1986), it is geographically isolated from other subspecies by a considerable distance.

Current distribution: Morocco. Last recorded in the 1970s when only three records were made (Crowe *et al.* 1986). Confined to an area between the Oum er Rbia and Sebou Rivers in the north-west.

Population status: A very poorly known subspecies and one which is rarely seen but believed to be very scarce in the one area from where it is known. The population is thought to have declined, but there are no data available on its current status. It is not known if it is present in any protected area. ISIS and the WPA census list holdings for the species as a whole, and not this subspecies separately.

Threats: Not known.



Previous distribution of *Numida meleagris sabyi*

Future action: Extensive surveys are urgently required to establish its status in former sites and recommend conservation action. A Population and Habitat Viability Assessment should be conducted as soon as sufficient data are available. See project 4.3.9.

3.3. Europe and the Middle East

3.3.1. See-see partridge *Ammoperdix griseogularis*

Conservation status: Mace-Lande - insufficient information; CITES - Not listed

Taxonomic status: Monotypic.

Current distribution: Arid and stony habitats from south-east Turkey and Iraq, east to Pakistan and north to south-east Uzbekistan and Tadzhikistan (Cramp & Simmons 1980; Ali & Ripley 1983; Johnsgard 1988). Unsuccessful introduction attempt to USA.

Population status: Thought to occur at low densities, but is widespread and parts of its range are little disturbed by human activities. Usually sedentary, though some altitudinal migration has been recorded in Pakistan. Distribution in south-east Turkey is believed to have increased from the Iraq border country since 1950, the reasons for which are unclear. Actual population estimates are impossible to ascertain.

Threats: So little is known about this species' ecology and distribution that threats can only be guessed at, though the remoteness of much of its range probably means that there are no major threats at present.

Future action: Sample surveys in suitable habitat to ascertain typical breeding population density.

3.3.2. Caspian Snowcock *Tetraogallus caspius*

Conservation status: Mace-Lande - vulnerable; CITES - Appendix 1

Taxonomic status: One of five species in the genus, this species has three subspecies *T. c. tauricus*, *T. c. caspius*, *T. c. semenowtianschankii*. Taxonomy not disputed.

Current distribution: Transcaucasia. *T. c. caspius* is known from northern Iran and Turkmenia, *T. c. tauricus* from Turkey and the Transcaucasus and *T. c. semenowtianschankii* from western Iran. Inhabits mountain

slopes from 2400/2500 m up to the tops of ridges. Found in the Kafar and Dilijan Reservations in Armenia and Kopetdag Reservation in Turkmenia (Roald Potapov *in litt.*). Seems to be poorly known.

Population status: The Transcaucasus (Armenia and Azerbaijan) had eleven populations totalling fewer than 850 individuals in 1978; Turkmenia had 350 in 1986; in Turkey it is found in scattered high mountains where its status is uncertain, but it may be locally numerous and the ICBP dispersed species project estimated 200-2000 individuals; north-west Iran has 7,000 - 8,000, giving a total population of 8550 - 11310 (Roald Potapov *in litt.*). There has been a strong decline within Armenia, Azerbaijan and Turkmenia. Based on the known range and abundance in some areas, the population is estimated at 5000-15,000. ISIS and the WPA census record no specimens in captivity.

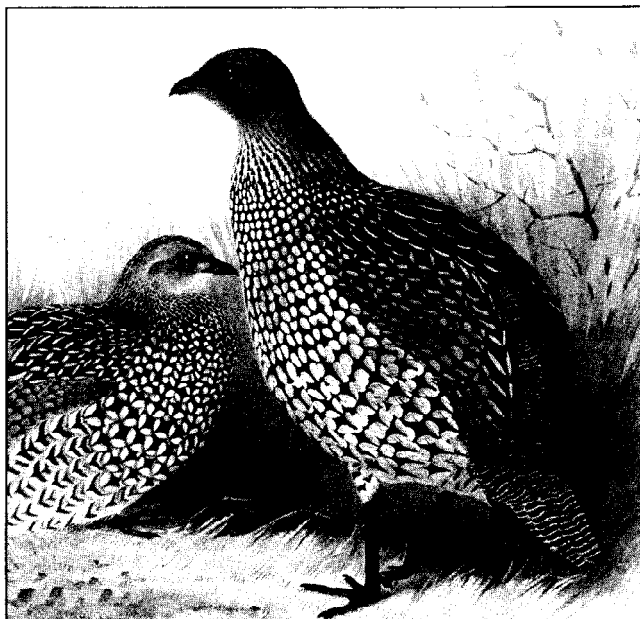
Threats: Overgrazing.

Future action: Habitat protection is needed and an extensive survey should aim to locate strong populations in Iran and Turkey and assess threats and protected area status (see project 4.4.1.).

3.4. South Asia

3.4.1. Painted francolin (Sri Lankan subspecies) *Francolinus pictus watsoni*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed



Painted francolin

Artist: Henry Jones

Taxonomic status: One of three subspecies. In partitioning the genus *Francolinus*, Crowe *et al.* (1992) placed this taxon in the subgenus *Francolinus* within the genus *Francolinus* (containing only the five Asian francolins), along with *francolinus* and *pintadeanus*.

Current distribution: Sri Lanka, restricted to the east where it is an endemic resident (Ali and Ripley 1983). G. M. Henry (in Ali and Ripley 1983) reports that it is only found in the dry zone up to about 1200 m in Uva Province.

Population status: There is very limited information on population numbers for this taxon. W. W. A. Phillips (in Ali and Ripley 1983) stated that the subspecies was very scarce in the grasslands of the Uva hills, but plentiful in the 'park country' of the adjoining Bibile and Nigala lowlands in 1952. Reported as 'rare' and declining in Johnsgard (1988). ISIS and the WPA census list holdings for the species as a whole, but not this subspecies in particular.

Threats: Hunting for food and habitat destruction.

Future action: An extensive survey is needed in the east of the island.

3.4.2. Swamp francolin *Francolinus gularis*

Conservation status: Mace-Lande - vulnerable; CITES - Appendix IV

Taxonomic status: Monotypic species (Johnsgard 1988). In partitioning the genus *Francolinus*, Crowe *et al.* (1992) place this species in a new monotypic subgenus *Limnocolinus* within *Francolinus*.

Current distribution: North India, Bangladesh and Nepal. Occurs in *terai* grassland (tall grasses and swamps from 50-200 m), which is now highly fragmented. Reported from 12 localities in northern India (Sàlim Javed and Asad Rahmani *in litt.*) and three in Nepal (Carol Inskipp *in litt.*) where there is now little suitable habitat. It is currently known from 12 protected areas in India (Wildlife Reserves, Reserve Forests, and National Parks), ranging in area from 11 square kilometres to 614 square kilometres (Sàlim Javed and Asad Rahmani *in litt.*) although the extent of habitat within these areas is unknown. Restricted to grasslands around marshes which are interspersed among extensive tracts of *Sal Shorea* woodland. In Nepal, recently recorded at Royal Sukla Phanta and Kosi Tappu Wildlife Reserves and Royal Bardia National Park (Carol Inskipp *in litt.*). Gary Robbins (*in litt.*) estimates a captive population of about 50 individuals.

Population status: Locally common and possibly 1,000-10,000 individuals in total. It is declining outside protected areas due to habitat destruction. It is known to use sugar

cane plantations around marshes adjacent to its natural habitats. The species does appear in markets in Lucknow from time to time and is a popular pet in some parts of India (Asad Rahmani *in litt.*). ISIS records 0 individuals and the WPA census, two in captivity.

Threats: Habitat destruction from expansion of agriculture and draining of swamps. Likely to be subjected to pesticides from run-off.

Future action: Extensive quantitative research to assess distribution inside and outside protected areas, to investigate use of sugar cane fields by the swamp francolin and to suggest management techniques in protected areas (see project 4.5.1.).

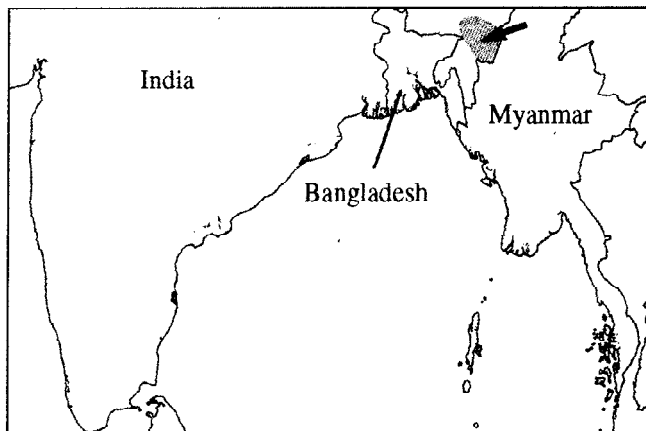
3.4.3. Manipur bush-quail *Perdica manipurens*

Conservation status: Mace-Lande - critical; CITES - Appendix IV

Taxonomic status: Two subspecies.

Current distribution: Occurs in North-east India and possibly in the Chittagong Hill Tracts in Bangladesh (Harvey 1990) inhabiting a very specific habitat dominated by elephant grass. A Restricted Range Species, occurring in Endemic Bird Area D09 which is the Assam plains and is a Priority I Endemic Bird Area (ICBP 1992).

Population status: No reliable figures, but based on the very small range and highly fragmented habitat the population must be small and is believed to be declining in numbers. A nest was recorded from the Manipur-Cachar border in India (Ali and Ripley 1983). There are now very few, if any, extensive areas of elephant grass left in Bangladesh and whilst some of the areas in north-east Bangladesh might be suitable in the dry season they are under water for two-thirds of the year (Paul Thompson *in*



Distribution of the Manipur bush-quail

litt.). Population size is unknown but estimated to be less than 10,000 and possibly less than 1,000. ISIS and the WPA census record no specimens in captivity.

Threats: Habitat loss and hunting for food.

Future action: An extensive survey (especially of former localities) to determine distribution and assess habitat requirements is urgently needed (see project 4.5.2.).

3.4.4. Red-breasted hill-partridge *Arborophila mandellii*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A monotypic species and most closely related to *A. gingica*, *A. rufogularis* and *A. javanica* - comprising one of the two species-groups in the Grey-breasted group of *Arborophila* (Davison 1982).

Current distribution: Historically distributed from Sikkim east through Bhutan to Arunachal Pradesh, North-east India, where it is believed to inhabit evergreen forest undergrowth at 350-2500 m. The range is relatively small and the habitat has probably always been fragmented. A Restricted Range Species, occurring in Endemic Bird Area D08, which is the Eastern Himalaya and is a Priority I Endemic Bird Area (ICBP 1992).

Population status: No information in the wild and ISIS and the WPA census record no specimens in captivity.

Threats: Forest cutting, slash and burn agriculture and hunting for food.

Future action: An extensive survey is urgently required.

3.4.5. Ceylon spurfowl *Galloperdix bicalcarata*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A monotypic species.

Current distribution: Endemic to part of Sri Lanka. A Restricted Range Species, occurring in Endemic Bird Area D05 which is Sri Lanka and is a Priority I Endemic Bird Area (ICBP 1992).

Population status: Unknown but probably declining because it is a forest species and forests are disappearing on the island. ISIS and the WPA census record no specimens in captivity.

Threats: Deforestation.

Future action: Survey needed.

3.4.6. Indian mountain quail *Ophrysia superciliosa*

Conservation status: Mace-Lande - critical/extinct; CITES - Appendix I

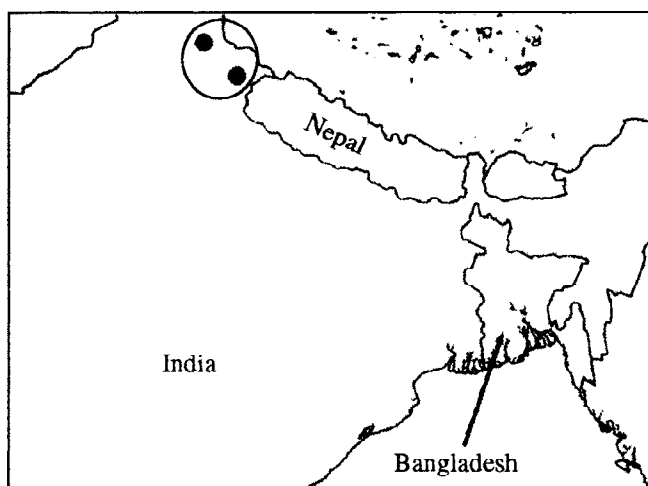
Taxonomic status: monotypic, known only from 9 museum skins.

Current distribution: Not known. Specimens were collected from Mussorie (1870) and Naini Tal (1876) in Uttar Pradesh, India (Rieger and Waltzhony 1992). A Restricted Range Species, occurring in Endemic Bird Area D02 which is the Western Himalayas and is a Priority II Endemic Bird Area (ICBP 1992).

Population status: A very small bird, it lives/lived in grasslands and so may be hard to locate. There have been a number of unconfirmed reports of this species in the last forty years (e.g. Ripley 1952, Negi 1992). There is also a recent unconfirmed record of the species from the 'Eastern lesser Himalaya' (Rieger *in litt.*). ISIS and the WPA census record no specimens in captivity.

Threats: Reasons for the possible extirpation of the species are not known.

Future action: Survey urgently needed to establish persistence of species (see project 4.5.3.).



Former known distribution of the Indian mountain-quail

3.5. China and Taiwan

3.5.1. Verreaux's monal-partridge *Tetraophasis obscurus*

Conservation status: Mace-Lande - insufficient information; CITES - Not listed

Taxonomic status: Unclear. This species may be conspecific with *T. szechenyi*. Cheng (1987) regarded them as conspecific. There are no subspecies.

Current distribution: Western China, where they are found between 3000 and 4100 m in upper coniferous forest, rhododendron shrubs and alpine meadow. There are at least 13 localities in Qinghai, Gansu and Sichuan (He Fen-qi *in litt.*).

Population status: Still quite common but declining slightly (He Fen-qi *in litt.*). ISIS and the WPA census record no specimens in captivity.

Threats: Habitat degradation.

Future action: Baseline survey needed to assess distribution and propose future actions.

3.5.2. Szechenyi's monal-partridge *Tetraophasis szechenyi*

Conservation status: Mace-Lande - insufficient information; CITES - Not listed

Taxonomic status: Unclear. This species may be conspecific with *T. obscurus*. Cheng (1987) regarded them as conspecific. There are no subspecies.

Current distribution: Widespread in high forest at altitude in Western China, where it is found between 3000 and 4300 m in upper coniferous forest and rhododendron shrubs. There are at least 14 localities in Qinghai, Xizang (Tibet), Sichuan and Yunnan (He Fen-qi *in litt.*). Only just enters north-east India (Ali and Ripley 1983).

Population status: Apparently widely distributed (He Fen-qi *in litt.*), but it may be very fragmented in its known range. ISIS and the WPA census record no specimens in captivity.

Threats: Not known.

Future action: Baseline survey needed to assess distribution and propose future actions.

3.5.3. White throated (Taiwan) hill-partridge *Arborophila crudigularis*

Conservation status: Mace-Land - vulnerable; CITES - Not listed

Taxonomic status: Monotypic

Current distribution: It occurs in the central and other mountain ranges in Taiwan, where it inhabits the temperate primary broadleaf and possibly also the mixed forest between 1500 and 2000 m (Lucia Liu Severinghaus *in litt.*). It is well represented in protected areas, occurring in Taroko (920 square kilometres), Hsueh-Ba (769 square kilometres) and Yushan (642 square kilometres) National Parks, Yu-Li (3.5 square kilometres), Chu-yun Shan (58.5 square kilometres), Nanao Lake and Hardwood (4.6 square kilometres) and Tsuifeng Lake (0.25 square kilometres) Wildlife Nature Reserves (Lucia Liu Severinghaus *in litt.*). A Restricted Range Species, occurring in Endemic Bird Area D25 which is Taiwan and is a Priority II Endemic Bird Area (ICBP 1992).

Population status: Formerly widespread at suitable elevations but there have been few records and no survey in recent years (Lucia Liu Severinghaus *in litt.*). The population is estimated at 5,000-10,000 and is declining outside protected areas. ISIS and the WPA census record no specimens in captivity, though Gary Robbins (*in litt.*) estimates a captive population of ten.

Threats: Pesticides and loss of forest for timber production and agriculture.

Future action: An extensive survey is needed in view of the paucity of recent records. Its status in protected areas especially needs assessing (see project 4.6.3.).

3.5.4. Sichuan hill-partridge *Arborophila rufipectus*

Conservation status: Mace-Land - critical; CITES - Not listed

Taxonomic status: A monotypic species which is included in one of the species-groups contained within the Grey-breasted group of *Arborophila* along with *A. crudigularis*, *A. atrogularis*, *A. ardens* and *A. orientalis* (Davison 1982).

Current distribution: Sichuan, China, where it is known from five localities within a range of about 1000 square kilometres. It is found in sub-tropical evergreen forest and woods usually below 2500 m (He Fen-qi *in litt.*). It is not found in any protected area (He Fen-qi *in litt.*). A Restricted

Range Species, occurring in Endemic Bird Area D14 which is the South China forests and is a Priority II Endemic Bird Area (ICBP 1992).

Population status: Estimated at about 1,000 and declining. ISIS and the WPA census record no specimens in captivity.

Threats: Habitat loss and degradation and artificial re-planting are major problems.

Future action: Whilst existing sites need monitoring, a protected area is desperately needed. A Population and Habitat Viability Assessment should be conducted to examine the options for a considered captive breeding programme. See project 4.6.1. for more details.



Distribution of the Sichuan hill-partridge

3.5.5. Collared hill-partridge *Arborophila gingica*

Conservation status: Mace-Land - endangered; CITES - Not listed

Taxonomic status: A monotypic species most closely related to *A. rufogularis*, *A. javanica* and *A. crudigularis* - comprising one of the two-species groups in the Grey-breasted group of *Arborophila* (Davison, 1982).

Current distribution: Distributed through Central and north-west Fujian and northern Guangdong in China (He Fen-qi *in litt.*), where it occurs in several protected areas. It may occur in East Guangxi. It inhabits densely wooded habitat in montane areas below 1000 m and whilst the range is large there is little available habitat. A Restricted Range Species, occurring in Endemic Bird Area D24 which is the Fujian mountains and is a Priority II Endemic Bird Area (ICBP 1992).

Population status: There is little information but the population is likely to be in decline because of extensive logging and the population is probably less than 10,000. It is now considered rare in its range. There is a captive breeding project in south China which comprised 14 females and 10 males in 1989. These birds produced 109 eggs of which six were reared and kept alive through to the following year (Li *et al.* 1992).

Threats: Deforestation and fragmentation of habitat in an area that has a very dense human population.

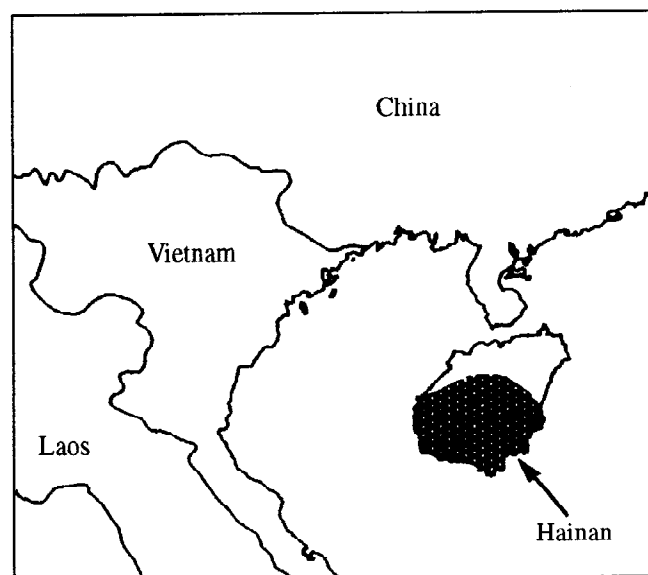
Future action: Extensive surveys in suitable habitat throughout the range area are needed, concentrating on existing protected areas (see project 4.8.7.). Any existing protected areas should be managed and the designation of new ones considered.

3.5.6. White-eared (Hainan) hill partridge *Arborophila ardens*

Conservation status: Mace-Lande - endangered; CITES - Not listed

Taxonomic status: Monotypic

Current distribution: Central areas of Hainan island, where it is known from five areas and possibly two more. Maybe also some localities in South Guangxi on the mainland (He Fen-qi *in litt.*), although the latter is not confirmed (Gao Yu-ren *in litt.*). Found in tropical evergreen forests and woods between 950 and 1200 m. Occurs in Ba Wang Ling Nature Reserve. A Restricted Range Species, occurring in Endemic Bird Area D20 which is Hainan and is a Priority II Endemic Bird Area (ICBP 1992).



Distribution of the white-eared hill partridge

Population status: Based on what little available habitat is left, the population is estimated to be less than 10,000, and probably much less. ISIS and the WPA census record no specimens in captivity.

Threats: Habitat loss due to timber extraction and conversion to agricultural land as well as degradation of other patches of suitable habitat (He Fen-qi *in litt.*). Also over-hunting for food.

Future action: A survey is needed to determine its distribution throughout the island and especially in protected areas plus need for more protected areas and research.

3.6. South-east Asia

3.6.1. Long-billed wood-partridge *Rhizothera longirostris*

Conservation status: Mace-Lande - vulnerable; CITES - Appendix III

Taxonomic status: Monotypic genus. Species comprises two subspecies *R. l. longirostris* and *R. l. dulitensis* which are treated together here.

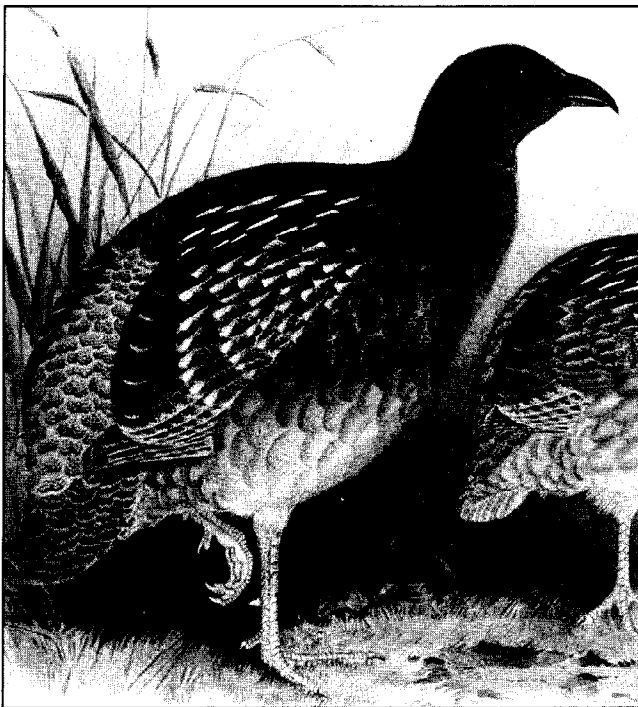
Current distribution: Thailand, Burma (?), Malaysia and Indonesia (Sumatra and Kalimantan). In Thailand it may be limited to the lowlands and foothills of peninsular Thailand, where the mountains are very steep, but it is presumed to ascend higher than this at Kaeng Krachen in South-west Thailand (CCB, Mahidol University). It is found in primary lowland, hill dipterocarp and upper dipterocarp forest in Malaysia from near sea level to 1500 m (Geoffrey Davison *in litt.*). In Indonesia it occurs in forest from sea level to 1000 m including high level tea estates on Sumatra and favouring limestone in Kalimantan (Bas van Balen and Derek Holmes *in litt.*). It is not recorded from any protected areas in Thailand, although it may occur in Kaeng Krachen National Park and Bung Kroeng Kavia Non-hunting Area (CCB, Mahidol University). In Peninsular Malaysia it is known from Krau Wildlife Reserve (530 square kilometres), Taman Negara National Park (4343 square kilometres) and Fraser's Hill Wildlife Sanctuary (30 square kilometres) and also from Danum Valley Research Centre in Sabah, East Malaysia (Geoffrey Davison *in litt.*). Recently recorded in Gunung Leuser National Park (7927 square kilometres) on Sumatra, but no records from any protected area in Kalimantan (Bas van Balen and Derek Holmes *in litt.*).

Population status: No recent record from any protected area in Thailand (population estimate for the country is in the low hundreds, but it may be extinct) (CCB, Mahidol

University), known from several sites in Malaysia (East and Peninsular) (Geoffrey Davison *in litt.*) and recently confirmed in Gunung Leuser on Sumatra, Indonesia (a report from Ulu Barito was not re-confirmed by survey, although calling is very sporadic; it may call for one or two days and then not for months at any one site). Most historical sites in Kalimantan are now largely deforested (this is probably also true for Sumatra and the Peninsula). Montane habitats (the species does occur in lower montane forest, but the bulk of its range is in lowland forest) are widespread on Sumatra (Bas van Balen and Derek Holmes *in litt.*) and in Peninsular Malaysia where the species is sparsely distributed (Geoffrey Davison *in litt.*). Presumed to be declining in Thailand (if it still occurs) (CCB, Mahidol University) and Malaysia (Geoffrey Davison *in litt.*), but in Indonesia most sites have already been lost (Bas van Balen and Derek Holmes *in litt.*). Based on habitat area and anecdotal information, it is estimated that there are over 1,000 individuals and perhaps considerably more (Craig Robson *in litt.*). ISIS and the WPA census record no specimens in captivity, although Gary Robbins (*in litt.*) estimates ten.

Threats: Mainly loss and alteration of habitat; clear-felling of forest for timber, loss of forest to agriculture and habitat degradation. Some over-exploitation for food also occurs in Thailand and possibly Indonesia.

Future action: Surveys of protected areas in Thailand and elsewhere to determine existence and habitat limits. Existing habitat needs protection. See projects 4.7.1. and 4.7.2.



Long-billed wood-partridge

Artist: Henry Jones

3.6.2. Black wood-partridge *Melanoperdix nigra*

Conservation status: Macc-Lande - vulnerable; CITES - Appendix III

Taxonomic status: Monotypic genus.

Current distribution: Malaysia and Indonesia (Sumatra and Kalimantan). It occurs in primary lowland forest from sea level to an unknown upper altitude limit (Geoffrey Davison *in litt.*). In Indonesia it is found in extreme lowland forest including wetland forest both on Sumatra and in Kalimantan (Derek Holmes and Bas van Balen *in litt.*). At Ulu Barito in Central Kalimantan it has been reported from 900 m in lower montane forest (Dutson 1990), which is an odd record, given the species' occurrence in the extreme lowlands in the Peninsula. There do, however, seem to be several species which inhabit extreme lowland forest in the Peninsula but occur in hill forests on Borneo (Wells 1985). It occurs in the following protected areas: Pasoh Forest Reserve (about 26 square kilometres), Krau Wildlife Reserve (530 square kilometres) and Gunung Mulu National Park (528 square kilometres) in Malaysia (Geoffrey Davison *in litt.*); Berbak Wildlife Reserve (1,900 square kilometres) on Sumatra; and Tanjung Puting National Park 3050 square kilometres) and Gunung Palung Nature Reserve (300 square kilometres) in Kalimantan (Derek Holmes and Bas van Balen *in litt.*).

Population status: It is believed to be very sparsely distributed in Malaysia (Geoffrey Davison *in litt.*) and probably also in Indonesia. Its status is determined by change in habitat cover and so it is presumably decreasing. Extreme lack of records makes a population estimate very difficult. Wetland/peat swamp forest is still widespread in Indonesia but even this is now becoming threatened (Derek Holmes and Bas van Balen *in litt.*). The Ulu Barito record extends the Bornean distribution to the lower hills. ISIS records 0 individuals and the WPA census, 4 in captivity although there may be as many as 20 in captivity (Gary Robbins *in litt.*).

Threats: Habitat loss and alteration, clear-felling for timber, forest loss to agriculture and forest degradation. Possibly over-hunted in Indonesia.

Future action: A survey should establish its distribution in all protected areas and examine the seemingly very specific habitat requirements. Habitat protection is needed, especially in lowland forests. Further protected area designation may be required. A concerted effort should be made to establish the localities of all birds in captivity and a breeding programme started. Included in projects 4.7.1. and 4.7.2.

3.6.3. Brown-breasted hill-partridge (north and south Vietnamese subspecies) *Arborophila brunnepectus henrici* and *albigula*

Conservation status: Mace-Lande - vulnerable; CITES - Appendix III

Taxonomic status: Two subspecies, both restricted to Vietnam, although *henrici* is probably also in South China. The nominate subspecies is the only subspecies other than that treated here and is regarded as safe, but *henrici* may also be safe (Craig Robson *in litt.*).

Current distribution: It occupies a restricted range in Vietnam and China; there is very little habitat in the latter. *A. b. albigula* has recently been recorded at six sites on the Da Lat and Di Linh Plateaux (Eames *et al.* 1992). *A. b. henrici* is recorded from Bach Ma National Park (189 square kilometres) (Eames *et al.* 1992), Cuc Phuong National Park, Tam Dao and Koncha Rang (Robson *et al.* 1989) in Vietnam, but *albigula* is not known from any protected area.

Population status: The population is probably quite large at present, but declining and becoming fragmented. ISIS records 0 individuals of the species and the WPA census, 26 in captivity. The subspecific affinity of these individuals is not known but most are thought to be of the safe nominate subspecies (Roland Wirth *in litt.*).

Threats: Habitat is being lost and fragmented, and the species is hunted for food.

Future action: Extensive surveys in Vietnam, especially for *albigula*, are required followed by the protection of existing habitat and establishment of new protected areas.

3.6.4. Bare-throated hill-partridge (Javan subspecies) *Arborophila orientalis orientalis*

Conservation status: Mace-Lande - vulnerable; CITES - Appendix III

Taxonomic status: This is the nominate subspecies and there are three other subspecies, which are treated separately. The species is included in one of the species groups contained within the Grey-breasted group of *Arborophilas* along with *A. crudigularis*, *A. atrogularis*, *A. ardens* and *A. rufipectus* (Davison 1982). Taxonomy above and below the species level needs clarifying.

Current distribution: This subspecies has a very restricted range in the mountains of eastern Java and is isolated from

the other subspecies. Its presence has been confirmed at two sites and is possible from two more in rain forest between 500 and 2200 m (Bas van Balen and Derek Holmes *in litt.*). It has recently been recorded in the Yang Highlands (141 square kilometres, but only a small part of this is suitable habitat for the species), Ijen Crater (25.6 square kilometres) Nature Reserve, and possibly from Meru Betiri National Park (500 square kilometres, but only a small part of this is suitable habitat for the species) (Bas van Balen and Derek Holmes *in litt.*).

Population status: The only recent information on the species in the wild are observations by Bas van Balen from the sites above. There are individuals in Surabaya Zoo and ISIS records 15 individuals of the species and the WPA census, 34 in captivity. Gary Robbins (*in litt.*) estimates 100 in captivity. Subspecific affinities of all individuals are not known, although some are definitely of the vulnerable nominate subspecies (Roland Wirth *in litt.*).

Threats: Habitat degradation and over-exploitation for food and the bird trade.

Future action: Taxonomic clarification is needed to determine if this taxon is best treated as a species or subspecies. In the meantime its distribution in protected areas should be clarified.

3.6.5. Bare-throated hill partridge (Malaysian, NW Sumatran and C Sumatran subspecies) *Arborophila orientalis campbelli/rolli/sumatrana*

Conservation status: Mace-Lande - vulnerable; CITES - Appendix III



Bare-throated hill partridge (*A. o. campbelli*)

Artist: Henry Jones

Taxonomic status: Three subspecies of four in the species. The nominate subspecies is treated separately because of its isolated distribution. The species is included in one of the species groups contained within the Grey-breasted group of *Arborophila* along with *A. crudigularis*, *A. atrogularis*, *A. ardens* and *A. rufipectus* (Davison 1982). Taxonomy above and below the species level needs clarifying.

Current distribution: Found in Peninsular Malaysia and Indonesia (Sumatra). Occurs in primary forest (upper dipterocarp, lower montane and tall upper montane forest) between 750 and 1600 m in Peninsular Malaysia (Geoffrey Davison *in litt.*). On Sumatra, it inhabits rain forest from 500-2200 m (Bas van Balen and Derek Holmes *in litt.*). It occurs in the Cameron Highlands (649 square kilometres) and Fraser's Hill (30 square kilometres) Wildlife Sanctuaries. In principle, all forest above about 750 m in Peninsular Malaysia is "Protection Forest". It has not recently been recorded from any protected area in Sumatra (Bas van Balen and Derek Holmes *in litt.*), but further searches are necessary.

Population status: It is regarded as sparsely distributed in suitable habitat in Malaysia (Geoffrey Davison *in litt.*) and numerous on Sumatra (Bas van Balen and Derek Holmes *in litt.*). It should be present all along the Main Range in Peninsular Malaysia and in the mountains of Sumatra, where suitable habitat is relatively secure. It is probably declining slightly in numbers. In captivity, ISIS records 15 individuals of the species and the WPA census, 34, but their subspecific affinities are not known.

Threats: Habitat loss for timber and agriculture, especially on Sumatra. Potentially, the road planned along the Main Range from Genting to Cameron Highlands in Peninsular Malaysia will disrupt much habitat.

Future action: Protect existing habitat (see project 4.7.1.).

3.6.6. Javan hill-partridge *Arborophila javanica*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A polytypic species with three subspecies - *A. j. javanica*, *A. j. bartelsi* and *A. j. lawuana*.

Current distribution: West and Central Java in Indonesia, where it inhabits forest between 300 and 3000m (Bas van Balen and Derek Holmes *in litt.*). It is present in Halimun (400 square kilometres), Gede/Pangrango (150 square kilometres) and Tengger/Semeru (570 square kilometres) National Parks; Puncak/ Megamendung (in part a Nature Reserve - 3.5 square kilometres); Tilu (80 square

kilometres), Tangkuban/Prahu (16.6 square kilometres); Papandayan Nature Reserve/Recreation Park (2.5 square kilometres); Sanggabuana Proposed Recreation Park; Lawu Proposed Nature Reserve (210 square kilometres), Gunung Karang and Salak Protected Forests and Mt. Kawi (Bas van Balen and Derek Holmes *in litt.*). A Restricted Range Species, occurring in Endemic Bird Area E13 which is the Javanese and Balinese mountains and is a Priority I Endemic Bird Area (ICBP 1992).

Population status: It is probably extirpated from the lower slopes by forest clearance in recent decades. Its population decline may now have stabilised. There are individuals in captivity at the Taman Mini Bird Park in Indonesia and ISIS records 21 individuals and the WPA census, 26 in captivity, whilst Gary Robbins (*in litt.*) has estimated 250 in captivity.

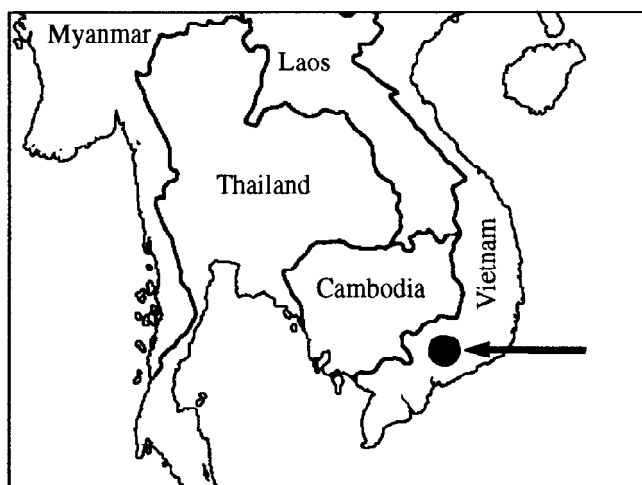
Threats: Deforestation in the form of timber collection, especially the margins of the forest, and the fragmentation of the habitat may pose a threat to the species. Some collection of live birds for the bird trade.

Future action: Stop the trade in this species and protect remaining habitat. A number of mountains, especially in Central Java, have not yet been surveyed for this species, but surveys are planned (Bas van Balen and Derek Holmes *in litt.*).

3.6.7. Orange-necked hill-partridge *Arborophila davidi*

Conservation status: Mace-Lande - endangered; CITES - Not listed

Taxonomic status: A monotypic species placed in the Brown-breasted group of *Arborophila*, which also includes *A. brunneopectus*, *A. cambodiana*, *A. hyperythra* and *A. rubrirostris* (Davison 1982).



Distribution of the orange-necked hill-partridge

Current distribution: Endemic to South Vietnam where it was only known from specimens collected at Bu Kroai (Bu Croi), Song Be Province (Cochinchina/S Annam) in 1927 (Delacour *et al.* 1927). Two birds were seen on 21st and 22nd June 1991, a single bird two days later near Dac Lua, Nam Bai Cat Tien National Park (350 square kilometres) (Eames *et al.* 1992) and two birds were seen well at the same site in early 1993 by Uthai Treesucon. The type series was collected at ca. 250 m in densely wooded country with rolling hills (Delacour *et al.* 1927). The 1991 observations were made at about 200 m in non-thorny bamboo forest, the bamboo being extremely dense in places and reaching 6 - 10 m in height (Eames *et al.* 1992). A Restricted Range Species, occurring in Endemic Bird Area D22 which is Cochinchina and is a Priority II Endemic Bird Area.

Population status: The above is the only information that we have on this species. However, some remaining habitat within its prescribed range has not yet been surveyed so the population size could be larger than this. ISIS and the WPA census record no specimens in captivity.

Threats: Since virtually nothing is known of the species' ecology, the scale of the threats to its survival are unknown. It is possible that the species has suffered a range contraction due to loss of habitat though most of the habitat loss so far has been on level lowlands which is probably unsuitable habitat for the species (Craig Robson *in litt.*).

Future action: Habitat protection and management is needed at the existing site and any further sites that are found after an extensive survey of suitable habitat to determine where the species still occurs (see project 4.7.3.).

3.6.8. Chestnut-headed hill-partridge (Cambodian subspecies)

Arborophila cambodiana cambodiana

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: One of two subspecies which are treated separately here. The species has been placed in the Brown-breasted group of *Arborophila*, which also includes *A. brunneopectus*, *A. davidi*, *A. hyperythra* and *A. rubrirostris* (Davison 1982).

Current distribution: Endemic to the Cardamon and Elephant mountains of Cambodia, where it occurs in tropical forest (Jonathan Eames *in litt.*). A very poorly known subspecies from an area where there is very little recent ornithological information. The species is a Restricted Range Species, occurring in Endemic Bird Area d19 which is not a highlighted Endemic Bird Area (ICBP 1992; unpub. data).

Population status: No information at all. Possibly declining because of habitat loss. ISIS and the WPA census record no specimens in captivity.

Threats: Habitat loss.

Future action: Extensive surveys are needed to determine distribution, habitat requirements and threats. Establishment of protected area(s) should be a priority after the surveys are completed. In addition, taxonomic clarification should assess whether *cambodiana* and *diversa* are best treated as species or subspecies.

3.6.9. Chestnut-headed hill-partridge (Thai subspecies)

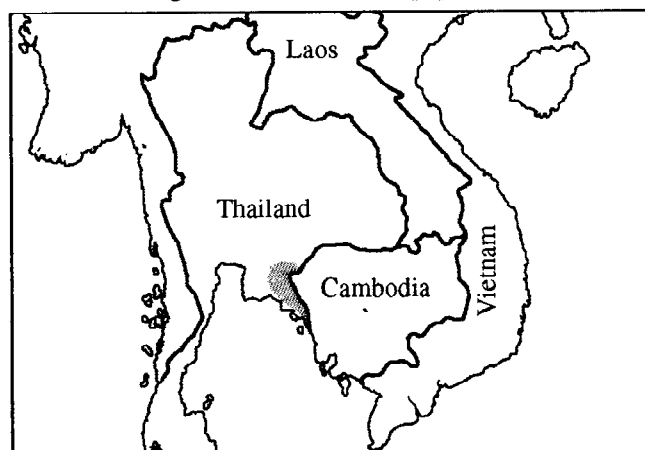
Arborophila cambodiana diversa

Conservation status: Mace-Lande - endangered; CITES - Not listed

Taxonomic status: One of two subspecies which are treated separately here. The species has been placed in the Brown-breasted group of *Arborophila*, which also includes *A. brunneopectus*, *A. davidi*, *A. hyperythra* and *A. rubrirostris* (Davison 1982).

Current distribution: South-east Thailand where it occurs from 700 m up to the mountain tops (CCB, Mahidol University). It is present in two protected areas, at Khao Sabap (135 square kilometres), within the Namtok Phliu National Park, and in Khao Soi Dao Wildlife Sanctuary (747 square kilometres) (CCB, Mahidol University). The species is a Restricted Range Species, occurring in Endemic Bird Area d19 which is not a highlighted Endemic Bird Area (ICBP, unpub data).

Population status: Definitely known from only the two localities mentioned above and its numbers are believed to be still declining. The estimated wild population could be in



Distribution of the Thai subspecies of chestnut-headed hill-partridge

the low hundreds. ISIS and the WPA census do not record any individuals of the species in captivity.

Threats: Deforestation - clear cutting of forest and over-exploitation for food (Round 1988).

Future action: Hunting should be stopped and existing habitat protected (see project 4.7.5.). Taxonomic clarification is needed to assess whether the two subspecies are distinct species, followed by full surveys of existing habitat.

3.6.10. Red-billed hill-partridge

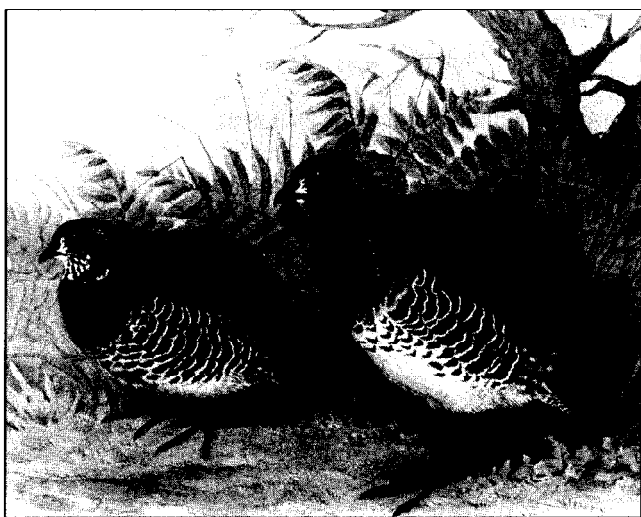
Arborophila rubrirostris

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A monotypic species. The species has been placed in the Brown-breasted group of *Arborophilas*, which also includes *A. brunneopectus*, *A. davidi*, *A. hyperythra* and *A. diversa* (Davison 1982).

Current distribution: Endemic to the island of Sumatra in Indonesia where it occurs in montane forest (including scrub in pine forest) between 900 and 2500 m from Aceh to southern Sumatra. It may favour steep gullies (Bas van Balen and Derek Holmes *in litt.*). It is found in two protected areas, Gunung Leuser (7927 square kilometres) and Kerinci-Seblat (14, 846 square kilometres) National Parks (Bas van Balen and Derek Holmes *in litt.*). A Restricted Range Species, occurring in Endemic Bird Area E11 which is Sumatra and Peninsular Malaysia (above 600 m) and is a Priority II Endemic Bird Area (ICBP 1992).

Population status: Known from three areas in Aceh, North Sumatra and South Sumatra and what is believed to be suitable habitat is still widespread throughout the mountains



Red-billed hill-partridge

Artist: Henry Jones

of Sumatra (Bas van Balen and Derek Holmes *in litt.*). Numbers may be stable. ISIS and the WPA census do not record any individuals of the species in captivity.

Threats: Habitat degradation may be a problem in some areas (Bas van Balen and Derek Holmes, *in litt.*).

Future action: Monitoring of habitat, to ensure its integrity (see project 4.7.1.).

3.6.11. Borneo hill-partridge

Arborophila hyperythra

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: There are two subspecies, *A. h. hyperythra* and *A. h. erythrophrys* which are treated together here. It has been suggested that the species is conspecific with *A. orientalis* (Johnsgard 1988), whereas Davison (1982) regards *orientalis* as belonging to one of the two Grey-breasted groups and *hyperythra* is one of five species in the Brown-breasted group along with *A. brunneopectus*, *A. davidi*, *A. rubrirostris* and *A. diversa*.

Current distribution: Endemic to Borneo (East Malaysia and Kalimantan, Indonesia). It inhabits montane forest of various types in Kalimantan (Bas van Balen and Derek Holmes *in litt.*) and has been recorded in primary lower montane forest between about 1200 and 1800 m (Geoffrey Davison *in litt.*). It is present in Gunung Mulu National Park (528 square kilometres) in Sarawak and Kinabalu National Park (754 square kilometres) and Sabah (where it is locally common), both in East Malaysia (Geoffrey Davison *in litt.*). Also present in Sungai Kayan/Sembakung Nature Reserve (?21,700 square kilometres) (Bas van Balen and Derek Holmes *in litt.*). A Restricted Range Species, occurring in Endemic Bird Area E10 which is the Borneo mountains and is a Priority I Endemic Bird Area (ICBP 1992).

Population status: The only recent Kalimantan record is from Ulu Barito (Dutson 1990) which extends the known range south by 150km. Other localities are Gunung Mulu National Park in Sarawak and Kinabalu National Park, Sabah, both in East Malaysia (Geoffrey Davison *in litt.*). Should also be present throughout the unsurveyed mountains of appropriate altitude in Sabah, Sarawak and Kalimantan (Bas van Balen and Derek Holmes *in litt.*). ISIS and the WPA census do not record any individuals of the species in captivity.

Threats: Degradation of habitat as a result of logging. Possibly over-hunted for food and sport in Kalimantan (Bas van Balen and Derek Holmes *in litt.*).

Future action: A survey is needed to determine the species' contemporary distribution after which the designation of further protected areas should be considered (see project 4.7.2.).

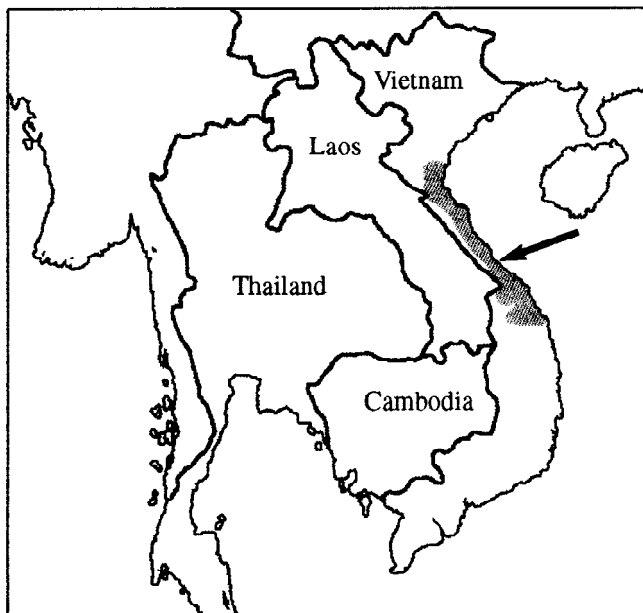
3.6.12. Annamese hill-partridge *Arborophila merlini*

Conservation status: Mace-Lande - endangered; CITES - Not listed

Taxonomic status: Confused. Johnsgard (1988) indicates that *A. charltonii* has 8 subspecies, of which *A. c. merlini* and *A. c. vivida* are sometimes considered specifically distinct. This latter convention is followed here and the two forms are regarded as subspecies of *A. merlini*. Because these two forms are geographically isolated from the forms included here in *A. charltonii* and *A. chloropus*, they also merit separate conservation attention.

Current distribution: Central Vietnam where it only occurs below 600 m and should, therefore, be considered a lowland forest specialist (Robson *et al.* 1993). It has been recorded from the Bach Ma National Park (189 square kilometres) at an altitude of 90-600 m (Robson *et al.* 1993). A Restricted Range Species, occurring in Endemic Bird Area D19 which is the Annamese lowlands and is a Priority II Endemic Bird Area.

Population status: Little information is available on its status in the wild. The current trend in population size is unknown but it is possibly in decline due to habitat destruction within its range. ISIS and the WPA census do not record any individuals of the species in captivity.



Distribution of the Annamese hill-partridge in Vietnam

Threats: Forest clearance for agriculture and degradation of habitat.

Future action: Habitat at known sites should be managed and protected. The range should be surveyed and research carried out to determine the population size in degraded and non-degraded habitats (see project 4.7.4.).

3.6.13. Scaly-breasted hill-partridge (Malay Peninsula subspecies) *Arborophila charltonii charltonii*

Conservation status: Mace-Lande - endangered; CITES - Appendix III

Taxonomic status: Confused. Johnsgard (1988) indicates that *A. charltonii* has 8 subspecies, of which *A. c. tonkinensis*, *A. c. atjenensis*, *A. c. graydoni* and *A. c. charltonii* are sometimes considered specifically distinct. Here *atjenensis*, *graydoni* and *charltonii* are regarded as belonging to a single species - *A. charltonii*. Because these three subspecies are geographically isolated from each other, they merit separate conservation attention. The taxon that Johnsgard refers to as *A. c. tonkinensis* is included in *A. chloropus* along with four other subspecies that Johnsgard assigned to *A. charltonii*; *A. c. chloropus*, *A. c. peninsularis*, *A. c. olivacea* and *A. c. cognacqi*.

Current distribution: Peninsular Thailand, Burma and Malaysia where it occupies lowland forest (plains and foothills). It is reported from primary forest in Malaysia (Geoffrey Davison *in litt.*) and conversely from heavily disturbed/secondary forest in Southern Thailand (CCB, Mahidol University). A pair was recorded from Khlong Phraya Wildlife Sanctuary in Thailand (Craig Robson *in litt.*), the total area of which is 95 square kilometres although most of this is unsuitable and steeply mountainous and there is probably less than one square kilometre of lowland forest around the margins (CCB, Mahidol University).

Population status: Based on the reduction in lowland forest habitat the population is estimated at 100-1,000. It is believed to be on the verge of extinction in Thailand (CCB, Mahidol University). ISIS and the WPA census do not record any individuals of the species in captivity.

Threats: Deforestation and habitat degradation.

Future action: An extensive survey throughout the historical range is urgently needed (see project 4.7.5.) along with taxonomic clarification above and below the species level.

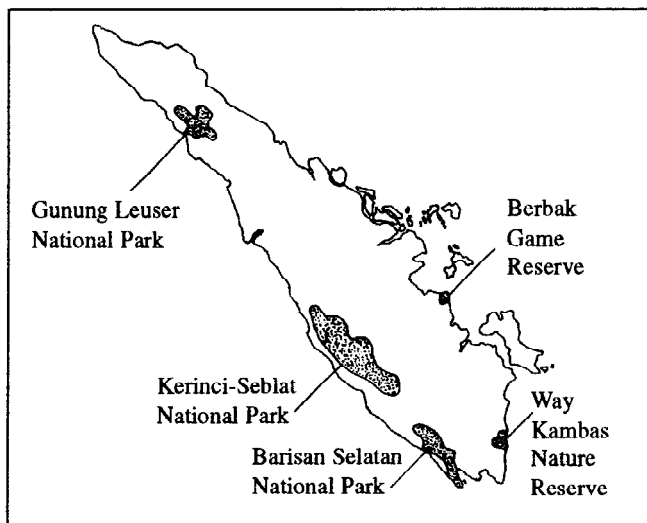
3.6.14. Scaly-breasted hill-partridge (Sumatran subspecies) *Arborophila charltonii atjenensis*

Conservation status: Mace-Lande - critical; CITES - Appendix III

Taxonomic status: Confused. Johnsgard (1988) indicates that *A. charltonii* has 8 subspecies, of which *A. c. tonkinensis*, *A. c. atjenensis*, *A. c. graydoni* and *A. c. charltonii* are sometimes considered specifically distinct. Here *atjenensis*, *graydoni* and *charltonii* are regarded as belonging to a single species - *A. charltonii*. Because these three subspecies are geographically isolated from each other, they merit separate conservation attention. The taxon that Johnsgard refers to as *A. c. tonkinensis* is included in *A. chloropus* along with four other subspecies that Johnsgard assigned to *A. charltonii*; *A. c. chloropus*, *A. c. peninsularis*, *A. c. olivacea* and *A. c. cognacqi*. The validity of this subspecies is doubted (Gerlof Mees *in litt.*).

Current distribution: North and South Sumatra. It is known only from specimens collected in the far north (North-east Aceh, 1939) and far south of Sumatra. Although a disjunct distribution, these two populations are believed to belong to the same subspecies. Exact forest type and altitude limits are not known but the highest altitude recorded is 300 m (Derek Holmes and Bas van Balen *in litt.*). *A. c. atjenensis* is not reported from any protected area, but it should be looked for in the North-east lowland limit of Gunung Leuser National Park (Derek Holmes and Bas van Balen *in litt.*). The distribution is assumed to be north-east Aceh and Lampung, although it may not necessarily be confined to these regions of Sumatra and surveys to determine its real status are urgently needed.

Population status: Most of the range in the south is now completely deforested and the subspecies has not been



National Parks and Reserves on Sumatra

recorded from Way Kambas National Park (Derek Holmes and Bas van Balen *in litt.*). Due to the large extent of habitat destruction, the population is estimated at less than 100. Now it is thought to exist only in the north of its range. ISIS and the WPA census do not record any individuals of the species in captivity.

Threats: Deforestation and habitat degradation.

Future action: A survey is urgently needed to establish whether the subspecies still exists (see project 4.7.1.). Depending upon results of the survey, habitat protection measures are a high priority. Taxonomic clarification is needed to determine whether the Sumatran forms are subspecifically distinct from those inhabiting the peninsula.

3.6.15. Scaly-breasted hill-partridge (Bornean subspecies) *Arborophila charltonii graydoni*

Conservation status: Mace-Lande - endangered; CITES - Appendix III

Taxonomic status: Confused. Johnsgard (1988) indicates that *A. charltonii* has 8 subspecies, of which *A. c. tonkinensis*, *A. c. atjenensis*, *A. c. graydoni* and *A. c. charltonii* are sometimes considered specifically distinct. Here *atjenensis*, *graydoni* and *charltonii* are regarded as belonging to a single species - *A. charltonii*. Because these three subspecies are geographically isolated from each other, they merit separate conservation attention. The taxon that Johnsgard refers to as *A. c. tonkinensis* is included in *A. chloropus* along with four other subspecies that Johnsgard assigned to *A. charltonii*; *A. c. chloropus*, *A. c. peninsularis*, *A. c. olivacea* and *A. c. cognacqi*.

Current distribution: Sabah, where it is found in primary lowland forest up to about 300 m. The only recent records are from Danum Valley (a state run research centre) although it may also occur along the Sungai Kinabatangan and in a few other places (Geoffrey Davison *in litt.*).

Population status: Due to the large extent of habitat destruction the population is probably small and may even be in the low hundreds. ISIS and the WPA census do not record any individuals of the species in captivity.

Threats: Deforestation and habitat degradation.

Future action: A survey is needed in suitable habitat to determine the subspecies' distribution (see project 4.7.2.). Taxonomic clarification is needed to determine the validity of the species and subspecies proposed in this assemblage of *Arborophila* forms.

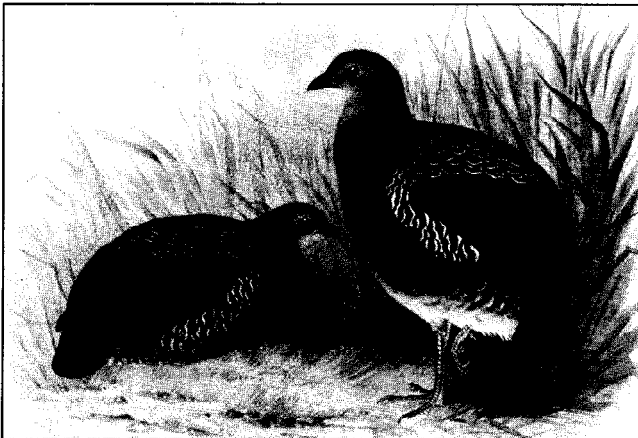
3.6.16. Ferruginous wood-partridge *Caloperdix oculea*

Conservation status: Mace-Lande - vulnerable; CITES - Appendix III

Taxonomic status: The only species in the genus and containing three subspecies; *sumatrana* on Sumatra, *borneansis* on Borneo and *oculea* in south-east Thailand and Malaysian Peninsula.

Current distribution: Thailand, Indonesia (Sumatra) and Malaysia. In Thailand it is found in evergreen forest, maybe chiefly in the lowlands and foothills in South Thailand, where the mountains are steep, but ascending to greater elevations elsewhere (CCB, Mahidol University). In Malaysia, it is found in primary forest up to about 1000 m on the Main Range (Geoffrey Davison *in litt.*). It is not recorded from Kalimantan, but on Sumatra it occurs in dry forest in the mountains up to 1000 m. Recent records from the extreme lowland site of Way Kambas National Park were unexpected. It is found in primary and secondary forest in sandy valleys (Derek Holmes and Bas van Balen *in litt.*). It is present in Beung Kroeng Kavia Non-Hunting area (120 square kilometres), Khao Pra Bang Khram (173 square kilometres), Thaleban National Park (85 square kilometres), Kaeng Krachen National Park (3083 square kilometres) and Khlong Phraya Wildlife Sanctuary in Thailand. The total area of this last Protected area is 95 square kilometres, most of which is unsuitable and steeply mountainous and there is probably less than one square kilometre of lowland forest around the margins (CCB, Mahidol University). In Malaysia it has been recorded from Taman Negara National Park (4343 square kilometres) and on Sumatra from Gunung Leuser National Park (7927 square kilometres) and Way Kambas National Park (1300 square kilometres) - only 50% of this last protected area contains forest (Derek Holmes and Bas van Balen *in litt.*).

Population status: It is widespread in the Sumatran hills (Derek Holmes and Bas van Balen *in litt.*), but very scarce



Ferruginous wood-partridge

Artist: Henry Jones

in Thailand (CCB, Mahidol University). The population is thought to be declining. ISIS records 17 individuals and the WPA census, 59 in captivity, whilst Gary Robbins (*in litt.*) estimates 100 in captivity.

Threats: Habitat destruction in Thailand, Malaysia and Indonesia (Derek Holmes, Bas van Balen, Geoffrey Davison and CCB, Mahidol University) and over-exploitation for food in Thailand (Round 1988).

Future action: Habitat at existing sites should be protected and managed and reserves from where it is known should be extensively surveyed to determine the limits of its habitat use (see projects 4.7.1. and 4.7.2.).

3.6.17. Crimson-headed wood-partridge *Haematortyx sanguiniceps*

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

Taxonomic status: A monotypic genus.

Current distribution: North-east Borneo, where it inhabits lower montane forest, including poor forest of sandy areas, between about 1000 and 1500m (Geoffrey Davison *in litt.*). It is known historically from the watershed regions of central Kalimantan and recently sound recordings were made in undisturbed montane forest in Kayan Mentarang (Derek Holmes and Bas van Balen *in litt.*). It has not been recorded from any protected area in Kalimantan (Derek Holmes and Bas van Balen *in litt.*), but it is found in Gunung Mulu National Park in Sarawak (528 square kilometres) (Geoffrey Davison *in litt.*). A Restricted Range Species, occurring in Endemic Bird Area E10 which is the Borneo mountains and is a Priority I Endemic Bird Area (ICBP 1992).

Population status: It is believed to be locally common but much of its original habitat has been lost. Anecdotal information and the extent of the range area indicate a population of less than 10,000. The population is thought to be declining (Geoffrey Davison *in litt.*) due to loss of habitat. ISIS and the WPA census do not record any individuals of the species in captivity, though a captive population of about 50 individuals has been estimated (Gary Robbins *in litt.*).

Threats: Habitat destruction and degradation (Geoffrey Davison, Derek Holmes and Bas van Balen *in litt.*).

Future action: Habitat at existing sites should be managed and reserves from where it is known should be extensively surveyed to determine the limits of its habitat use (see project 4.7.2.).

3.6.18. Crested wood-partridge

Rollulus rouloul

Conservation status: Mace-Lande - vulnerable; CITES - Appendix III

Taxonomic status: A monotypic genus.

Current distribution: South-east Asia. In Thailand it is found in evergreen forest in the plains and foothills (CCB, Mahidol University); in Malaysia it inhabits primary and logged forest up to about 1500 m (Geoffrey Davison *in litt.*); in Indonesia it occurs in primary and other old forests up to 800 m (Sumatra) and 1200 m (Kalimantan), but mainly in the lowlands (Derek Holmes and Bas van Balen *in litt.*). It is present in the following protected areas: Khao Pra Bang Kham (173 square kilometres), Thaleban National Park (85 square kilometres), Khao Phanom Bencha (50 square kilometres) and Khlong Nakha (463 square kilometres) in Thailand (CCB, Mahidol University); Pasoh Forest Reserve (about 25 square kilometres), Krau Wildlife Reserve (530 square kilometres), Taman Negara (4343 square kilometres), Endau-Rompin proposed State Park (total area would be about 800 square kilometres in Johore and Pahang states), Gunung Mulu National Park 528 square kilometres), Danum Valley Research Centre and Kinabalu National Park (54 square kilometres) in Malaysia (Geoffrey Davison *in litt.*); Gunung Leuser (7927 square kilometres) and Way Kambas (1300 square kilometres, although only about 50% contains forest) National Parks on Sumatra; and Tanjung Puting National Park (3050 square kilometres) in Kalimantan (Derek Holmes and Bas van Balen *in litt.*). The historical and contemporary distribution has been reviewed and micro-habitat use assessed (McGowan 1992).

Population status: Based on anecdotal information and the extent of the range area the population is estimated at 1,000-100,000 and almost certainly declining in all three countries. It is scarce and much reduced in Thailand (CCB, Mahidol

University), the habitat is severely threatened in Indonesia (Derek Holmes and Bas van Balen *in litt.*) and it is presumed to be declining because of logging in Malaysia (Geoffrey Davison *in litt.*). ISIS records 608 individuals and the WPA census, 297 in captivity. There are probably about 1000 in captivity in total (Gary Robbins *in litt.*).

Threats: Capture for the bird trade and over-exploitation for food in Thailand (Round, 1988). Habitat destruction and degradation throughout its range (McGowan, 1992).

Future action: The first priority for this species is to manage and protect the habitat at existing sites (see projects 4.7.1. and 4.7.2.). In Thailand, hunting should be stopped. A captive breeding programme should be started to manage the specimens in captivity properly.

3.6.19. Mountain bamboo-partridge

Bambusicola fytchii

Conservation status: Mace-Lande - vulnerable; CITES - Not listed

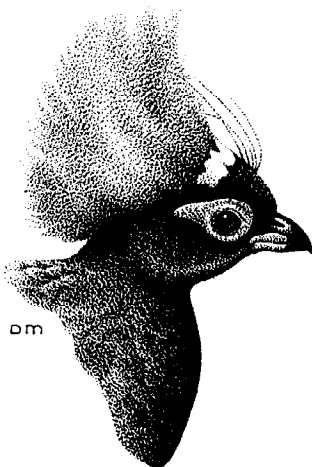
Taxonomic status: Two subspecies.

Current distribution: China, India, Bangladesh, Burma, Thailand and Vietnam. In Thailand it occurs in open, deforested hillsides where it inhabits swiddens with scattered woodlots above 1000 m (CCB, Mahidol University).

Population status: A large range but its distribution is limited and probably fragmented within this. Globally it is declining, but there are probably more than 10,000 individuals. In Thailand it is believed to be widespread above 1000 m in the north-west and probably increasing in numbers (CCB, Mahidol University). It appears to thrive in secondary scrub jungle and grassland (Jonathan Eames *in litt.*). ISIS records 7 individuals and the WPA census, 46 in captivity.

Threats: Suffering from habitat loss throughout its range. Subject to hunting in India and by hill tribes in Thailand (Jonathan Eames *in litt.*).

Future action: An extensive survey is needed in India and China.



Crested wood-partridge

Artist: David Mead

4. Five year plan of action

The previous chapter has provided a summary of the information that is of conservation importance for all non-safe taxa of partridges, quails, francolins, snowcocks and guineafowl and outlined action that should help prevent the taxa from becoming extinct in the wild. This chapter seeks to build upon the recommendations of the previous chapter by outlining key projects that the Specialist Group will attempt to start itself or encourage others to initiate during the period 1995 - 1999.

The plan of action presented here is designed to be a realistic statement of goals that galliform biologists and conservationists can meet during the five years of this plan. The scale of threat to this group of birds is considerable and the extent of the action needed to conserve these species for the future is great. The Specialist Group, regrettably, is not in a position to try to accomplish all of the actions recommended by the end of 1999. This chapter, therefore, presents a programme that addresses some of the most serious problems facing this group of species as a whole. It must be stressed, however, that, in an ideal world, all of the actions listed in Chapter 2 and, especially, Chapter 3 would be addressed and that attempts to tackle those problems by any organisation or individual are strongly urged, whether or not a project is included in this chapter.

Projects for inclusion in the plan of action for the partridges, quails and francolins for 1995 - 1999 have been selected according to the following criteria: conservation urgency, feasibility and the resources necessary. The conservation urgency of a project is largely based on the Mace-Lande threat category (see Section 2.1) of the taxa. All taxa that are vulnerable, endangered, critical and critical/extinct were considered for inclusion as were those for which we have insufficient information on conservation status. The feasibility criterion assessed the ease with which the project could be carried out in the field and considered aspects such as civil unrest (*e.g.* armed combat in Angola and Djibouti) and logistics. When assessing resources needed, the main factor considered was the knowledge of trained personnel in the country/region who could conduct the work or help with advice and information, so as to minimise the financial and other resources needed to see the project to a successful conclusion.

In addition to the main projects given in each regional section, three of the sections (Africa, China including Taiwan and South-east Asia) contain summaries of projects that are considered important, but less feasible at present for various reasons. These reasons may include: civil unrest, as in the case of the grey-striped francolin of Angola which is desperately in need of conservation attention; a lack of detailed information on project scope, as in the case of the threatened partridges of Thailand; or taxa considered to be of relatively lower priority than those included in the main part of the plan. Under this last criterion we have included both threatened Moroccan subspecies which are isolated from other subspecies in what are otherwise widespread and extremely numerous species. Nonetheless, we urge all those interested in the conservation of the world's partridges, quails, francolins, snowcocks and guineafowl to consider action on behalf of these taxa.

Before presenting the five year plan of action, there follows a summary of the threatened species covered in Chapter 3 and the future action proposed for each. This summary table should provide a ready reference for those interested in the conservation of the partridge, quail, francolin and guineafowl species as to what is desperately needed.

SCIENTIFIC NAME ENGLISH NAME	M-L CAT.	FUTURE ACTIONS	PROJECT PROPOSED
AMERICAS			
<i>Dendrortyx barbatus</i> Bearded tree-quail	C	Survey	4.2.3.
<i>Odontophorus melanotis</i> Black-eared wood-quail	V	Survey, Taxonomic clarification	4.2.1. & 4.2.2.
<i>Odontophorus atrifrons</i> Black-fronted wood-quail	V	Survey, Taxonomic clarification	4.2.2.
<i>Odontophorus hyperythrus</i> Chestnut wood-quail	V	Survey, Taxonomic clarification	4.2.2.
<i>Odontophorus melanonotus</i> Dark-backed wood-quail	V	Survey, Taxonomic clarification	4.2.2.
<i>Odontophorus dialeucos</i> Tacarcuna wood-quail	V	Survey, Taxonomic clarification	4.2.2.
<i>Odontophorus strophium</i> Gorgeted wood-quail	E	<i>In situ</i> management, Survey, Taxonomic clarification	4.2.2. & 4.2.4.
<i>Odontophorus columbianus</i> Venezuelan wood-quail	V	Survey, <i>In situ</i> management, Taxonomic clarification	4.2.2.
<i>Odontophorus leucolaemus</i> Black-breasted wood-quail	V	Survey, Taxonomic clarification	4.2.2.
<i>Odontophorus balliviani</i> Stripe-faced wood-quail	V	Survey	4.2.2.
<i>Cyrtonyx ocellatus</i> Ocellated quail	V	Survey	4.2.1.
AFRICA			
<i>Francolinus schlegelii</i> Schlegel's banded francolin	?	None needed at present	No
<i>Francolinus griseostriatus</i> Grey-striped francolin	?	Survey	4.3.4.
<i>Francolinus bicalcaratus ayesha</i> Double-spurred francolin (Moroccan subsp.)	E	Taxonomic clarification, <i>In situ</i> management, Intensive research, Population and Habitat Viability Assessment, Survey	4.3.5.
<i>Francolinus nahani</i> Nahan's forest francolin	?	Survey, <i>In situ</i> management	4.3.1.
<i>Francolinus camerunensis</i> Cameroon mountain francolin	V	<i>In situ</i> management, Survey	4.3.6.
<i>Francolinus swierstrai</i> Swierstra's francolin	V	<i>In situ</i> management, Survey	4.3.4.
<i>Francolinus ochropectus</i> Djibouti francolin	E	Survey, <i>In situ</i> management, Intensive Research, Population and Habitat Viability Assessment	4.3.2.
<i>Margaroperdix madagascarensis</i> Madagascar partridge	V	Survey, Captive management, <i>In situ</i> management	4.3.7.
<i>Xenoperdix udzungwensis</i> Udzungwa forest partridge	V	Survey, <i>In situ</i> management, Taxonomic clarification	4.3.3.
<i>Agelastes meleagrides</i> White-breasted guineafowl	V	Survey, <i>In situ</i> management	4.3.8.
<i>Numida meleagris sabyi</i> Helmeted guineafowl (Moroccan subsp.)	E	Survey, Population and Habitat Viability Assessment	4.3.9.
EUROPE AND MIDDLE EAST			
<i>Ammoperdix griseogularis</i> See-see partridge	?	Survey	No
<i>Tetraogallus caspius</i> Caspian snowcock	V	Survey	4.4.1.
CHINA AND TAIWAN			
<i>Tetraophasis obscurus</i> Verreaux's monal-partridge	?	Survey, Taxonomic clarification	No
<i>Tetraophasis szechenyi</i> Szechenyi's monal-partridge	?	Survey, Taxonomic clarification	No
<i>Arborophila crudigularis</i> White-throated hill-partridge	V	Survey	4.6.3.
<i>Arborophila ardens</i> White-eared (Hainan) hill-partridge	E	Survey, <i>In situ</i> management	4.6.2.
<i>Arborophila rufipectus</i> Sichuan hill-partridge	C	Survey, <i>In situ</i> management, Intensive research	4.6.1.

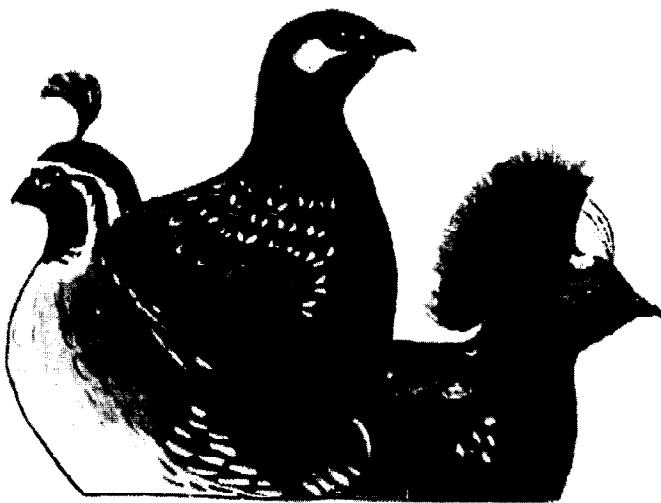
<i>Arborophila gingica</i> Collared hill-partridge	E	Survey, <i>In situ</i> management	4.6.4.
<i>Bambusicola fytchii</i> Mountain bamboo-partridge	V	Survey	No
SOUTH ASIA			
<i>Tetraophasis szechenyii</i> Szechenyi's monal-partridge	?	Survey, Taxonomic clarification	No
<i>Francolinus pictus watsoni</i> Painted francolin (Sri Lankan subsp.)	V	Survey	No
<i>Francolinus gularis</i> Swamp francolin	V	Intensive research, <i>In situ</i> management	4.5.1.
<i>Perdica manipurens</i> Manipur bush-quail	C	Survey, Intensive research	4.5.2.
<i>Arborophila mandellii</i> Red-breasted hill-partridge	V	Survey	No
<i>Galloperdix bicalcarata</i> Ceylon spurfowl	V	Survey	No
<i>Ophrysia superciliosa</i> Indian mountain-quail	C/EX	Survey	4.5.3.
<i>Bambusicola fytchii</i> Mountain bamboo-partridge	V		No
SOUTH-EAST ASIA			
<i>Rhizothera longirostris</i> Long-billed wood-partridge	V	<i>In situ</i> management	4.7.1. & 4.7.2.
<i>Melanoperdix nigra</i> Black wood-partridge	V	Survey, <i>In situ</i> management, Captive management	4.7.1. & 4.7.2.
<i>Arborophila brunneopictus albigula/henrici</i> Brown-breasted hill-partridge (N. and S. Vietnam subsp.)	V	Survey, <i>In situ</i> management	No
<i>Arborophila orientalis orientalis</i> Bare-throated hill-partridge (Javan subsp.)	V	<i>In situ</i> management, Stop bird trade, Taxonomic clarification	No
<i>Arborophila orientalis rollei/sumatrana/campbelli</i> Bare-throated hill-partridge (Malaysian and NW. and C. Sumatran subsp.)	V	<i>In situ</i> management, Taxonomic clarification	4.7.1.
<i>Arborophila javanica</i> Javan hill-partridge	V	Stop bird trade, <i>In situ</i> management	No
<i>Arborophila davidi</i> Orange-necked hill-partridge	E	Survey, <i>In situ</i> management	4.7.3.
<i>Arborophila cambodiana cambodiana</i> Chestnut-headed hill-partridge (Cambodian subsp.)	V	Survey, Taxonomic clarification	No
<i>Arborophila cambodiana diversa</i> Chestnut-headed hill-partridge (Thai subsp.)	E	<i>In situ</i> management, Taxonomic clarification	4.7.5.
<i>Arborophila rubrirostris</i> Red-billed hill-partridge	V	<i>In situ</i> management	4.7.1.
<i>Arborophila hyperythra</i> Borneo hill-partridge	V	<i>In situ</i> management, Taxonomic clarification	4.7.2.
<i>Arborophila merlini</i> Annamese hill-partridge	E	<i>In situ</i> management, Survey	4.7.4.
<i>Arborophila charltonii atjenensis</i> Scaly-breasted hill-partridge (Sumatran subsp.)	C	Survey, <i>In situ</i> management, Taxonomic clarification	4.7.1.
<i>Arborophila charltonii graydoni</i> Scaly-breasted hill-partridge (Bornean subsp.)	E	Survey, <i>In situ</i> management, Taxonomic clarification	4.7.2.
<i>Arborophila charltonii charltonii</i> Scaly-breasted hill-partridge (Peninsular Malaysian subsp.)	E	Survey, <i>In situ</i> management, Taxonomic clarification	4.7.5.
<i>Caloperdix oculea</i> Ferruginous wood-partridge	V	<i>In situ</i> management	4.7.1. & 4.7.2.
<i>Haematortyx sanguiniceps</i> Crimson-headed wood-partridge	V	Survey, <i>In situ</i> management	4.7.2.
<i>Rollulus rouloul</i> Crested wood-partridge	V	<i>In situ</i> management, Captive management	4.7.1. & 4.7.2.
<i>Bambusicola fytchii</i> Mountain bamboo-partridge	V	Survey	No

Increasing the coverage of the Specialist Group network

Aim: To establish links with appropriate personnel in countries/regions that are important for partridge, quail, francolin, snowcock and guineafowl species but not yet covered by the Specialist Group.

Justification: The Specialist Group aims to promote the conservation of the world's partridge, quail, francolin, snowcock and guineafowl species by: a) providing a network of correspondents who are concerned about their future; b) co-ordinating research efforts and other conservation measures which further their conservation and highlight species of immediate concern. In order to do this effectively the Specialist Group relies on correspondents throughout the natural range of these species providing information on various research and other conservation initiatives and alerting the Specialist Group to issues of immediate conservation concern. Currently the Specialist Group network of regional correspondents is uneven in its coverage of regions inhabited by partridges and their allies throughout the world. Therefore, the Specialist Group is concerned that the plight of some species passes unnoticed and possible conservation actions are not initiated. This project aims to address this problem by broadening the coverage of the regional correspondent network of the Specialist Group to include all regions that are important for partridges, quails, francolins, snowcocks and guineafowl.

Project description: Regional correspondents should be sought from all major gaps in the global distribution of partridge, quail, francolin, snowcock and guineafowl species. Regional correspondents should be wildlife managers, biologists, conservationists, captive managers or other persons knowledgeable about species in this group in particular, or regional avifaunas in general.



Countries/regions for which correspondents are desperately needed are:

Americas: Central and South America
Africa: West Africa, Cameroon, Morocco
South-east Asia and Australasia: Laos, Cambodia, Burma, Australia

Time scale: Five years

Budget: \$5,000

Identification of key areas for the conservation of Asian Galliformes

Aim: To identify areas important for the conservation of Galliformes in Asia and to promote their protection.

Justification: ICBP (1992) have mapped areas of avian endemism throughout the world. This analysis is based on the uniqueness of regional avifaunas, which has been measured as the number of Restricted Range (<50,000 square kilometres) Species. These areas of avian endemism, known as Endemic Bird Areas, can be very extensive and include the whole of a known vegetation type in a particular region. For example the Western Himalaya Endemic Bird Area is considered to be 33,000 square kilometres and the Yunnan Mountains in China, 26,000 square kilometres. For effective conservation, particular sites within these large tracts of land must be identified for protection measures and/or survey work. In Columbia and Ecuador, it has been found that centres of avian endemism show very little overlap with existing protected areas (Terborgh and Winter 1983).

Taking this Endemic Bird Area analysis a stage further, Eames and Rands (1993) reported that conservation of 82% of Asia's threatened galliform species would also meet the conservation requirement of all the region's Restricted Range Species and many other threatened taxa. Therefore, using the relatively well-known Galliformes to identify key blocks of habitat on the ground within the Endemic Bird Areas already mapped will be a major step forward in targeting key areas for biodiversity conservation initiatives.

Project description: A system will be developed whereby data on the localities from which individual species have been recorded can be related to information on vegetation types, altitude and protected-area networks. Recently obtained information on the distribution of Asian Galliformes will be analysed to assist in both short-term and long-term conservation planning for these species. This analysis will have two objectives:

1. To identify important protected areas for Galliformes and highlight species not covered by the protected area network and pinpoint areas for immediate attention. Key areas on the ground where groups of species occur together will also be revealed and unsurveyed areas at particular altitudes and with appropriate vegetation which may hold threatened species will be indicated.
2. With regard to long-term conservation planning, this analysis will reveal the biological characteristics of species which are prone to extinction at various levels. Such characteristics include the size of the species' distribution, the vegetation type that it inhabits and its altitude limits.

Time scale: Three years

Budget: \$140,000

Suggested reading:

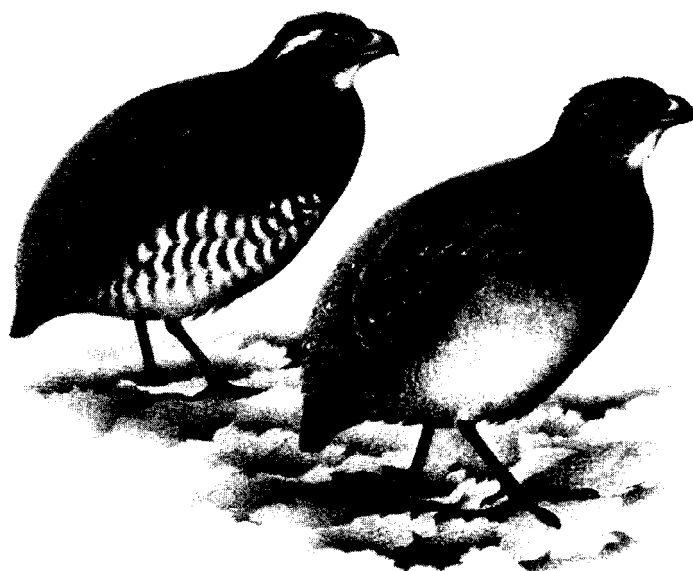
- Eames, J.C. and Rands, M.R.W. 1993. A new perspective on the conservation of Galliformes in Asia. In: Jenkins, D. (ed) *Pheasants in Asia* 1992:1-6.
- I.C.B.P. 1992. *Putting Biodiversity on the map: priority areas for global conservation*. International Council for Bird Preservation, Cambridge, U.K.
- Terborgh, J. and Winter, B. 1983. A Method for Siting Parks and Reserves with Special Reference to Colombia and Ecuador. *Biological Conservation* 27:43-58.

Assessment of the conservation status of neotropical quails in northern Central America

Mace-Lande status: Six safe and two vulnerable species.

Aim: Assessment of the status of forest quails in Southern Mexico, Belize, Guatemala and Honduras, through broad surveys of areas within the region.

Justification: Despite the large number of quails in the region between southern Mexico and Honduras, very little is known of the biology and conservation status of these species. Northern Central America is rich in both species and genera of New World quail and it has been suggested that neotropical quails evolved in Northern Central America and radiated to both North and South America (Johnsgard 1988). Whilst many of the species included in this project are considered safe, this assessment is based on a small amount of indirect evidence. Consequently, there is an urgent need to establish baseline distribution information for all species and to assess their representation in protected areas. Many of the target species have rather small and disjunct distributions and most species inhabit forests, the majority of which are at risk due to deforestation and conversion of land to cattle and agriculture.



Tawny-faced quail

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Artist: David Mead

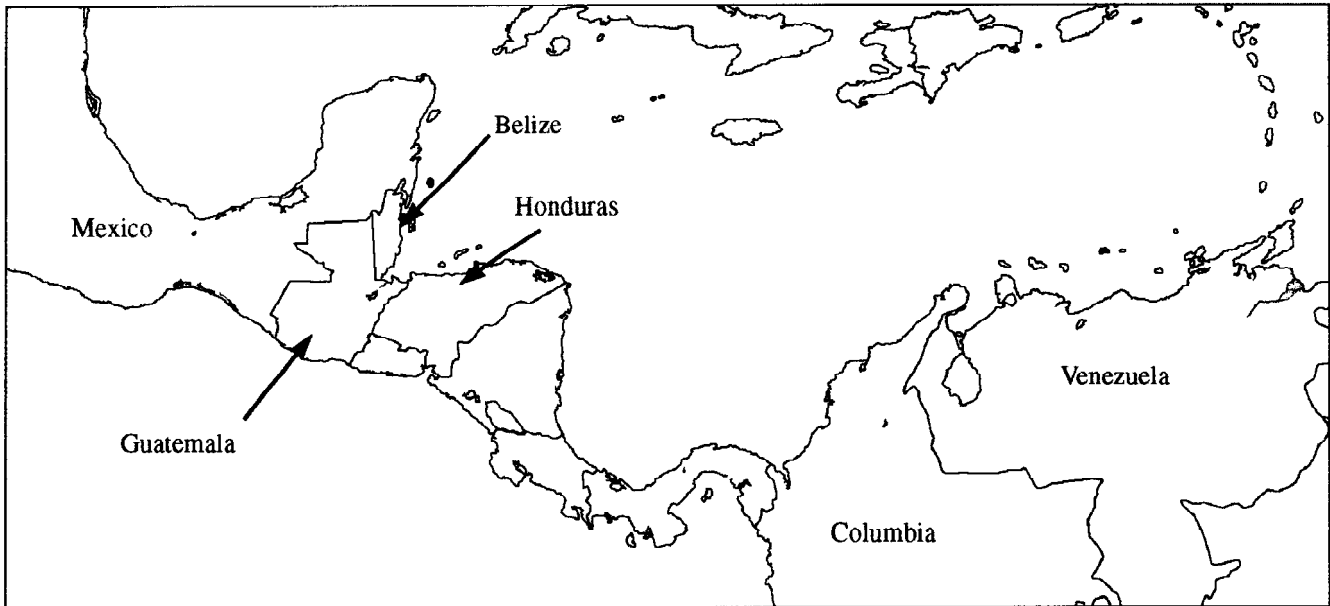
Project description: The following four activities should be carried out:

1. Develop a network of reserves and important habitats for survey in appropriate countries.
2. Utilise survey techniques developed in the *Odontophorus* plan (see next project, 4.2.2.) to identify key areas where the species listed below are found.
3. Using habitat data, previous literature and survey data, develop potential distribution maps for each species in region.
4. Develop future management and a research plan for species that might be severely impacted by human activities. This could include monitoring of quails in key reserves, follow up work in areas outside reserves that might contain key habitats and more intensive research activities on important species for future Conservation Assessment consideration.

Time scale: One to two years

Budget: \$10,000-\$25,000

Assessment of the conservation status of neotropical quails in northern Central America



Key quail species inhabiting northern Central America

Species	Habitat	Countries
<i>Dendrortyx leucophrys</i>	Montane cloud-forest	Mexico, Guatemala
<i>Dactylortyx thoracicus</i>	Montane cloud-forest	Mexico, Guatemala
<i>Cyrtonyx ocellatus</i>	Forest	Honduras
<i>Rhynchortyx cinctus</i>	Lowland rainforest	Mexico, Guatemala, Honduras
<i>Odontophorus melanotis</i>	Tropical and subtropical forest	Honduras
<i>Odontophorus guttatus</i>	Montane rainforest	Honduras
<i>Colinus leucopogon</i>	Brush	Mexico, Belize, Guatemala
<i>Colinus nigrogularis</i>	Brush	Mexico, Belize
<i>Colinus virginianus</i> ssp.	Brush	Mexico

Suggested reading:

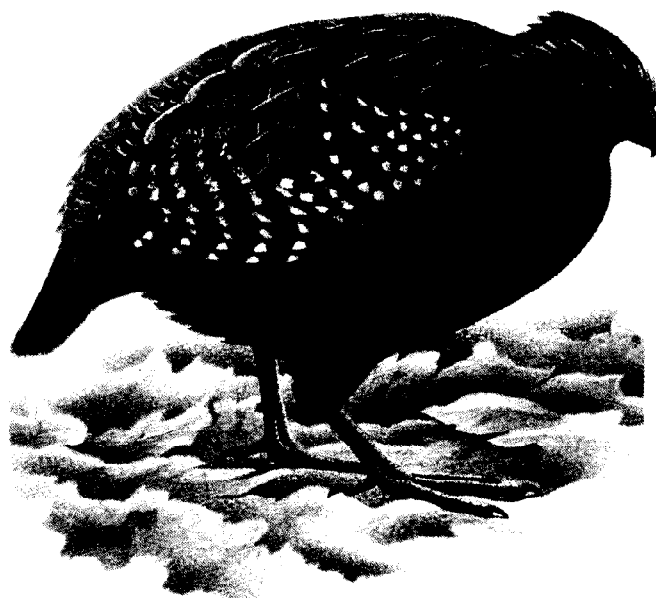
- Collar, N.J., Gonzaga, L.P., Krabbe, N., Madroño Nieto, A., Naranjo, L.G., Parker, T.A., III and Wege, D.C. 1992. *Threatened Birds of the Americas: The ICBP/IUCN Red Data Book*. Third edition, part 2. International Council for Bird Preservation, Cambridge.
- Johnsgard, P.A. 1988. *Quails, Partridges and Francolins of the World*. Oxford University Press, Oxford.
- Land, H.C. 1970. *Birds of Guatemala*. Livingston Publishing Company, Wynnewood, Pennsylvania.
- Monroe, B.L. 1968. A distributional survey of the birds of Honduras. *Ornithological Monograph No. 7*, American Ornithologist's Union.

South American wood-quail *Odontophorus* monitoring and conservation plan

Mace-Lande status: Two safe, eight vulnerable and one endangered species.

Aim: To estimate the distributions and population sizes of *Odontophorus* species and develop a method for establishing density. To deploy a number of stations in Central and South America, using workers and materials already present, targeting these species which either: a) occupy representative habitats, enabling extrapolation of density estimates to species not included or, b) are species of particular conservation concern.

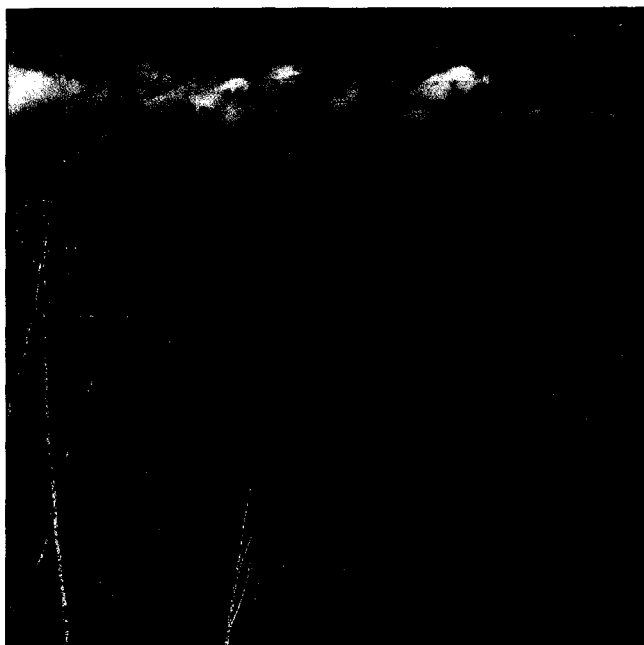
Justification: The *Odontophorus* wood-quails are forest species occurring from lowland to mountains, tropical to temperate habitats. Although some natural history data are available, the genus is little studied and no information exists concerning population densities or human impacts. A number of the species are Restricted Range Species (ICBP unpub. data) and some are considered to be vulnerable or endangered.



Spot-winged wood-quail

Artist David Mead

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Wood-quail habitat in Venezuela

Photo: John Carroll

Survey methods have not been designed although the species are vocal and coveys may be readily encountered. Most species are of some conservation concern as they are considered threatened or possibly threatened. These species (and their Mace-Lande status') are: the black-eared wood-quail *Odontophorus melanotis* (vulnerable), the black-fronted wood-quail *O. atrifrons* (vulnerable), the chestnut wood-quail *O. hyperythrus* (vulnerable), the dark-backed wood-quail *O. melanonotus* (vulnerable), the Tacarcuna wood-quail *O. dialeucos* (vulnerable), the Venezuelan wood-quail *O. columbianus* (vulnerable), the black-breasted wood-quail *O. leucolaemus* (vulnerable), the stripe-faced wood-quail *O. balliviani* (vulnerable), and the gorgeted wood-quail *O. strophium* (endangered). Some of these species might be considered for individual

South American wood-quail monitoring and conservation plan

projects in the future, once survey techniques are developed and population sizes estimated. The taxonomic status of a number of *Odontophorus* species needs to be better defined as some might be conspecific.

Project description: Specific tasks that should be used are as follows:

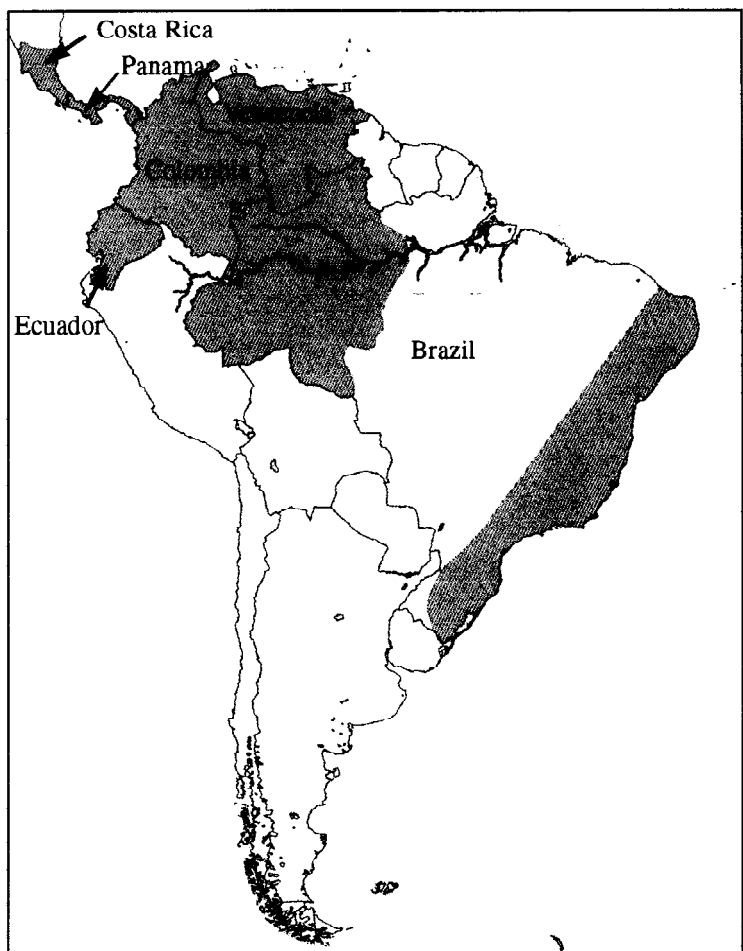
1. Carry out a pilot study to devise appropriate survey methodologies, *e.g.* at Henri Pittier National Park, Venezuela using *O. columbianus*.
2. Develop a network of interested individuals and institutions active in the region.
3. Carry out a training workshop, involving about 15 national biologists (representing Brazil, Costa Rica, Panama, Colombia, Ecuador, and Bolivia) to develop efficiency in standardised survey methods.
4. Gather data on an annual basis from at least three locations for each species/region, addressing if possible the following species: *O. capueira*, *O. melanotis*, *O. atrifrons*, *O. erythrops*, *O. hyperythrus*, *O. melanonotus*, *O. dialeucos*, *O. columbianus*, *O. leucolaemus*, *O. balliviani*, and *O. strophium*.
5. Using the population density data, make estimates of the overall population sizes and distributions using a Geographic Information System (GIS), to re-appraise the Mace-Lande categories which are used here.

Time scale: Five years

Budget: \$50,000-\$100,000

Suggested reading:

- Collar, N.J., Gonzaga, L.P., Krabbe, N., Madroño Nieto, A., Naranjo, L.G., Parker, T.A., III and Wege, D.C. 1992. *Threatened Birds of the Americas: The ICBP/IUCN Red Data Book*. Third edition, part 2. International Council for Bird Preservation, Cambridge.
- I.C.B.P. 1992. *Putting Biodiversity on the map: priority areas for global conservation*. International Council for Bird Preservation, Cambridge, U.K.
- Johnsgard, P.A. 1988. *Quails, Partridges and Francolins of the World*. Oxford University Press, Oxford.
- Negret, A.J. 1991. Reportes recientes en el Parque Nacional Muniche de aves consideradas raras o amenazadas de extinción. *Noved. Columbianus (nueva epoca)* 2:70-71.



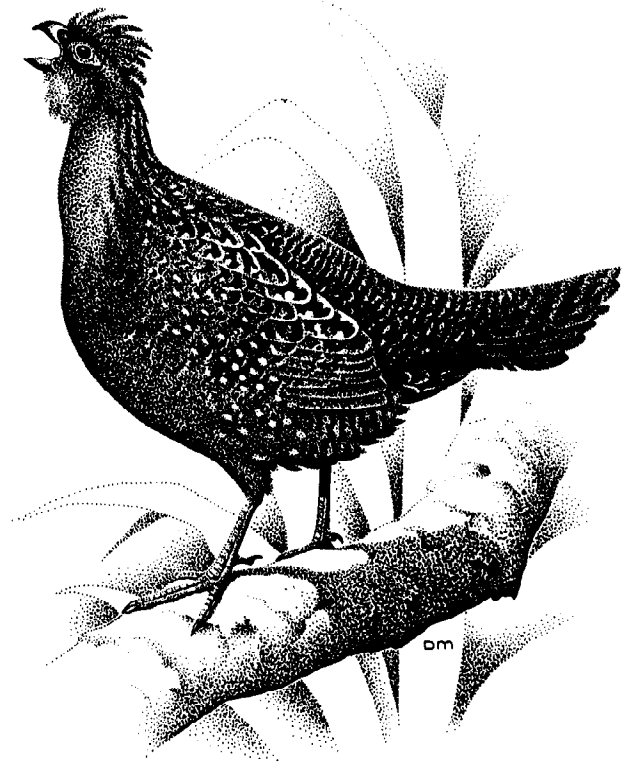
Distribution of wood-quails in South America

Status and conservation of the bearded tree-quail *Dendrortyx barbatus* in Mexico

Mace-Lande status: Critical

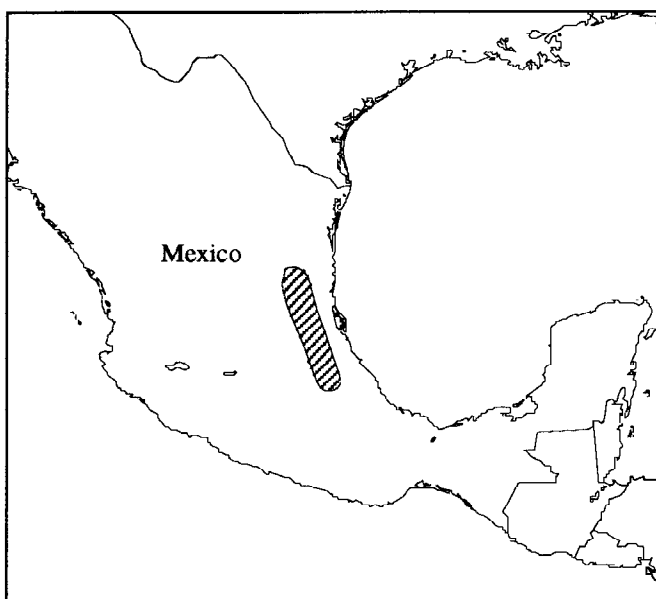
Aim: Conservation of a viable population of the bearded tree-quail and the development of a conservation management plan.

Justification: The bearded tree-quail is a critically threatened Restricted Range Species (ICBP unpublished data; see ICBP 1992) dependent on a small area of humid montane forest in the Sierra Madre Oriental in Hidalgo and Veracruz, Mexico where forest loss continues at a rapid rate. Most of the documented populations are old, and habitat in many of these areas has been destroyed as a result of forest clearance (Collar *et al.* 1992). There have been few sightings since the 1960s. An immediate priority is the location of any extant population and the urgent development of a management plan in the light of survey findings, given the rate of forest loss.



Bearded tree-quail

Artist: David Mead



Range of *D. barbatus* in Mexico

Project description: The following should be carried out:

1. Locate patches of suitable habitat, perhaps through initial aerial and satellite mapping.
2. Survey the habitat to locate extant populations, estimate size, area of remaining habitat and assess a degree of threat.
3. Carry out management workshop (Population and Habitat Viability Assessment) involving local agencies to identify viable populations and their conservation requirements.
4. If wild populations are considered to be not viable then a captive programme might be proposed to minimise the risk of extinction.

Status and conservation of the bearded tree-quail in Mexico

Time scale: Five years

Budget: \$50,000-\$100,000

Suggested reading:

- Collar, N.J.Gonzaga, L.P., Krabbe, N., Madroño Nieto, A., Naranjo, L.G., Parker, T.A., III and Wege, D.C. 1992. *Threatened Birds of the Americas: The ICBP/IUCN Red Data Book*. Third edition, part 2. International Council for Bird Preservation, Cambridge.
- Howell, S.N. and Webb, S. 1992. A little-known cloud forest in Hidalgo, Mexico. *Euphonia* 1:7-11.
- I.C.B.P. 1992. *Putting biodiversity on the map: priority areas for global conservation*. International Council for Bird Preservation, Cambridge.
- Johnsgard, P.A. 1988. *Quails, Partridges and Francolins of the World*. Oxford University Press, Oxford.

Protection of viable populations of the gorgeted wood-quail *Odontophorus strophium* in Colombia

Mace-Lande status: Endangered

Aim: Support Fundacion Natura in the deployment of a Colombian biologist to determine population size and density of species in Virolin forest and survey for other extant populations.

Justification: The gorgeted wood-quail is a globally threatened species which is endemic to the severely threatened temperate and subtropical forests of the western slopes of the Columbian East Andes. It was known historically from the Cundinamarca department, but now it is known only from one locality in 100 square kilometres of forest at Virolin in Santander department. This area also supports other endemic species such as the threatened hummingbird *Coeligena prunellei*. The Bogota-based Fundacion Natura NAO has promoted the formal designation of the Cachalu



Gorgeted wood-quail

Artist: David Mead

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Coffee and banana plantations can still provide wood-quail habitat in Colombia

Photo: John Carroll

Wildlife Sanctuary. It is developing a strategy to secure the protection of adjoining forests with local agencies. However, much of the valley bottom around Virolin has been cleared and much of the remaining forest is accessible to future clearing (Brooke 1988). Hunting is a major threat in the remaining forests (Collar *et al.* 1992).

Project description: Follow up to the previous studies of this species at Virolin should be given the highest priority. The following activities are proposed:

Protection of viable populations of the gorgeted wood-quail in Colombia

1. Use the survey methods designed during the *Odontophorus* monitoring plan to estimate the size and density of the population in the Virolin region.
2. Identify other areas of suitable habitat in Santander and Cundinamarca departments. Survey such identified areas for the gorgeted wood-quail and interview hunters at these sites.
3. Draw up a management plan for the species as part of a forest conservation programme for the region.

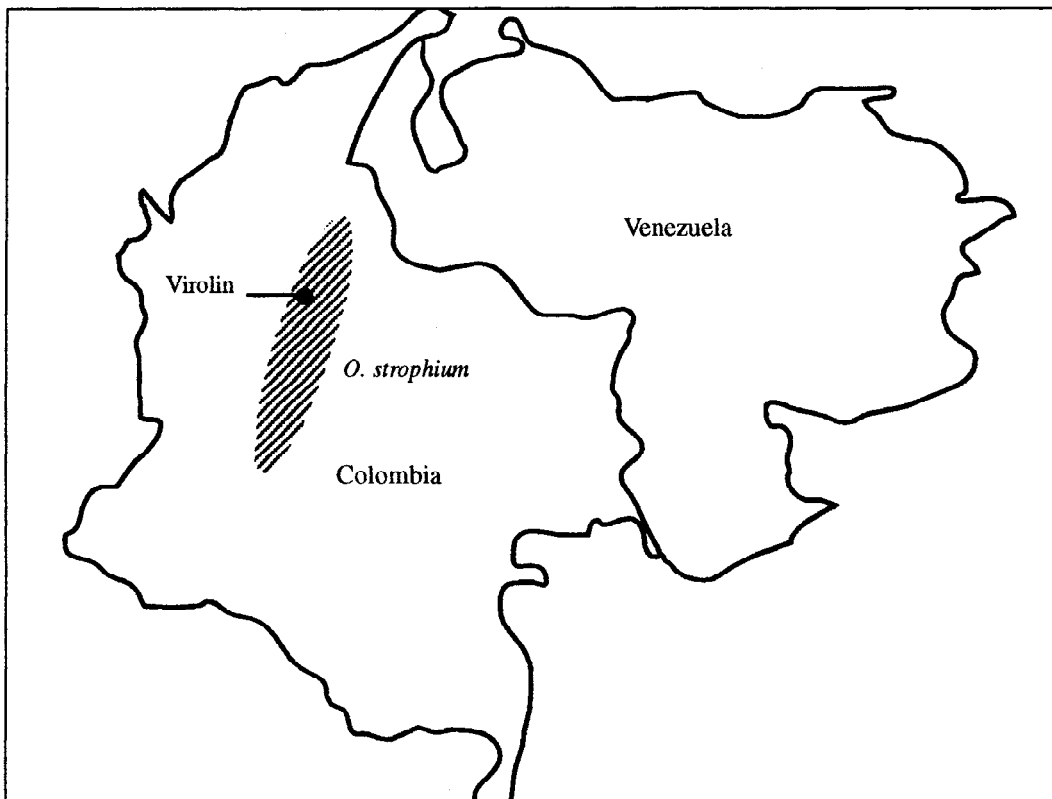
Future projects should include more intensive research on the biology and habitats of this species. The use and value of second-growth forest and selectively cut forests by the species should be investigated.

Time scale: Two years

Budget: \$10,000-\$25,000

Suggested reading:

- Brooke, M. de L. 1988. *The ornithological significance of the Virolín area, Santander, Colombia, with special reference to Gorgeted Wood-quail* *Odontophorus strophium*. Unpublished report.
- Collar, N.J., Gonzaga, L.P., Krabbe, N., Madroño Nieto, A., Naranjo, L.G., Parker, T.A., III and Wege, D.C. 1992. *Threatened Birds of the Americas: The ICBP/IUCN Red Data Book*. Third edition, part 2. International Council for Bird Preservation, Cambridge.
- Romero-Zambrano, H. 1983. Revisión del status zoogeográfico y redescrípción de *Odontophorus strophium* (Gould) (Aves: Phasianidae). *Caldasia* 13:777-786.



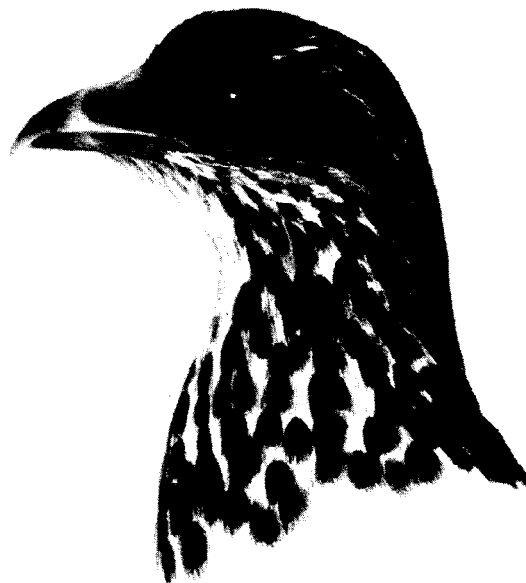
Location of range of *O. Strophium* and Virolin field centre

Survey of forest Galliformes in southern Uganda

Mace-Lande status: One insufficient information taxon and five safe taxa.

Aim: To establish the presence and density of four species of francolin, *Francolinus nahani*, *F. squamatus*, *F. lathamii* and *F. nobilis* and possibly two guineafowl, *Guttera pucherani* and *G. plumifera* in the remaining tropical forests of southern Uganda.

Justification: On the basis of its restricted range and the disappearance of its forest habitat, Nahan's francolin *F. nahani* is potentially a species under threat. However, practically nothing is known about the status of this bird in the wild and information is needed urgently so that the degree of threat, if any can be established and measures can be taken to protect it. Three other forest francolin species, namely the scaly francolin *F. squamatus*, Latham's forest francolin *F. lathamii* and handsome francolin *F. nobilis* also occur in



Nahan's francolin

Artist: Timothy Greenwood



Kibale forest, Uganda

Photo: Tropical Biology Association

similar tropical forest habitat, providing an opportunity to collect baseline information on all four of these relatively little-known species in the same project.

Project description: There are three forest reserves which are accessible from Kampala that would provide the main study areas for this survey project; Kibale (560 square kilometres), Mabira (306 square kilometres) and Bugoma (365 square kilometres). Kibale has a field station belonging to Makerere University which could be used as a base. Surveys of the four francolin species would be carried out using call

Survey of forest Galliformes in southern Uganda

playback techniques and possibly mist-netting during the dry season from June to December which is the breeding season for the forest francolins.

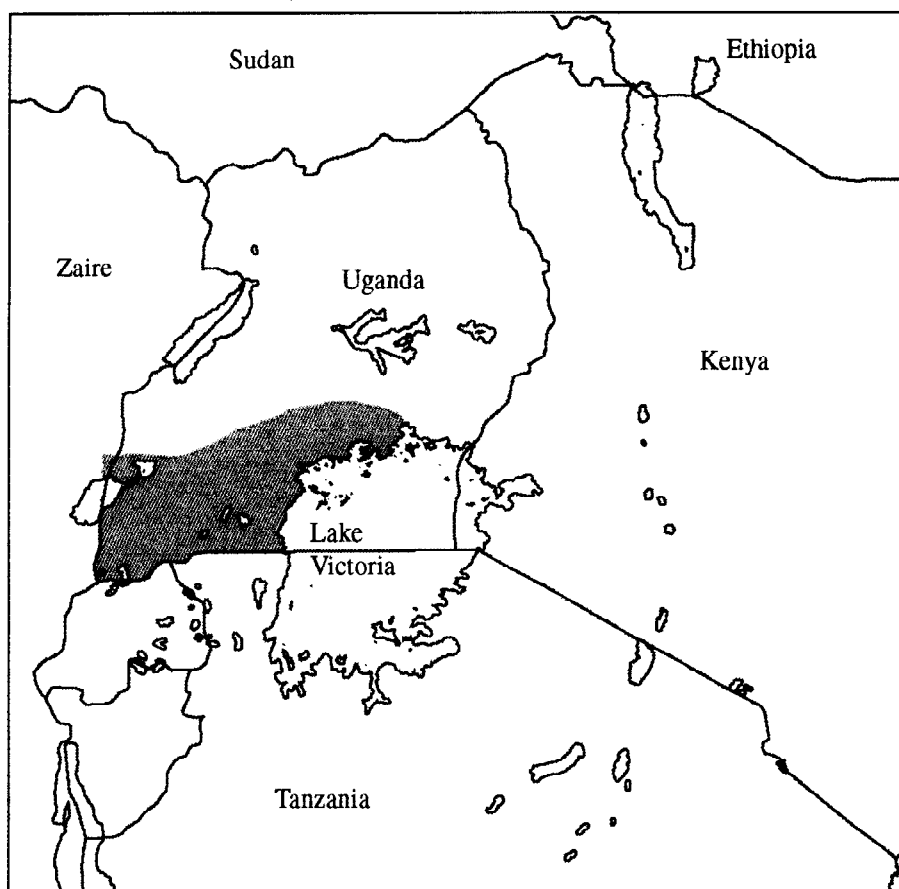
There is an ongoing study of forest bird ecology in the Kibale forest, which could provide a base for co-ordinated survey efforts. Two other Galliformes which may occur in these forests are the crested guineafowl *Guttera pucherani* and the plumed guineafowl *G. plumifera*. Neither are deemed to be threatened as yet but further knowledge on their distribution would be useful.

Time scale: Annual surveys for three years minimum.

Budget: \$3,000-\$5,000

Suggested reading:

- Pomeroy, D. and Abe, E. 1992. The distribution and abundance of gamebirds in Africa with special reference to East Africa. In: Birkan, M., Potts, G.R., Aebischer, N.J. and Dowell, S.D. (eds.) *Perdix VI, First International Symposium on Partridges, Quails and Francolins. Gibier Faune Sauvage* 9:527-537.
- Crowe, T. M., Keith, L.S. and Brown, L.H. 1986. Galliformes. In: Urban, E. K., Fry, C. H. and Keith, S. (eds.) *The birds of Africa* Vol 2:1-75. Academic Press, London.



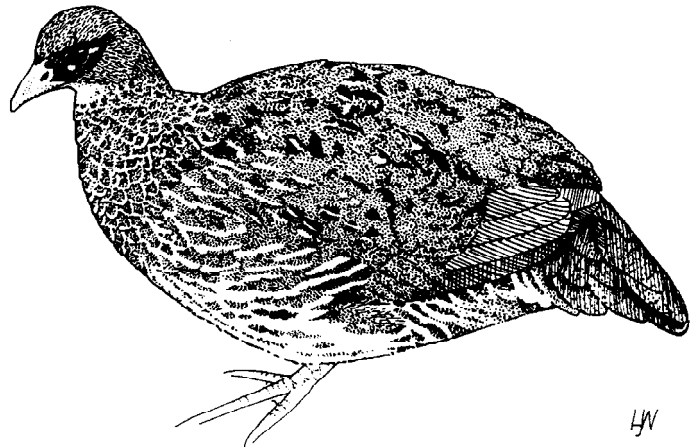
Location of proposed project area for survey of forest galliformes in Southern Uganda

Conservation of the Djibouti francolin *Francolinus ochropectus* in Djibouti

Mace-Lande status: Endangered

Aim: To determine the remaining population of Djibouti francolin and ensure its urgent protection from further decline.

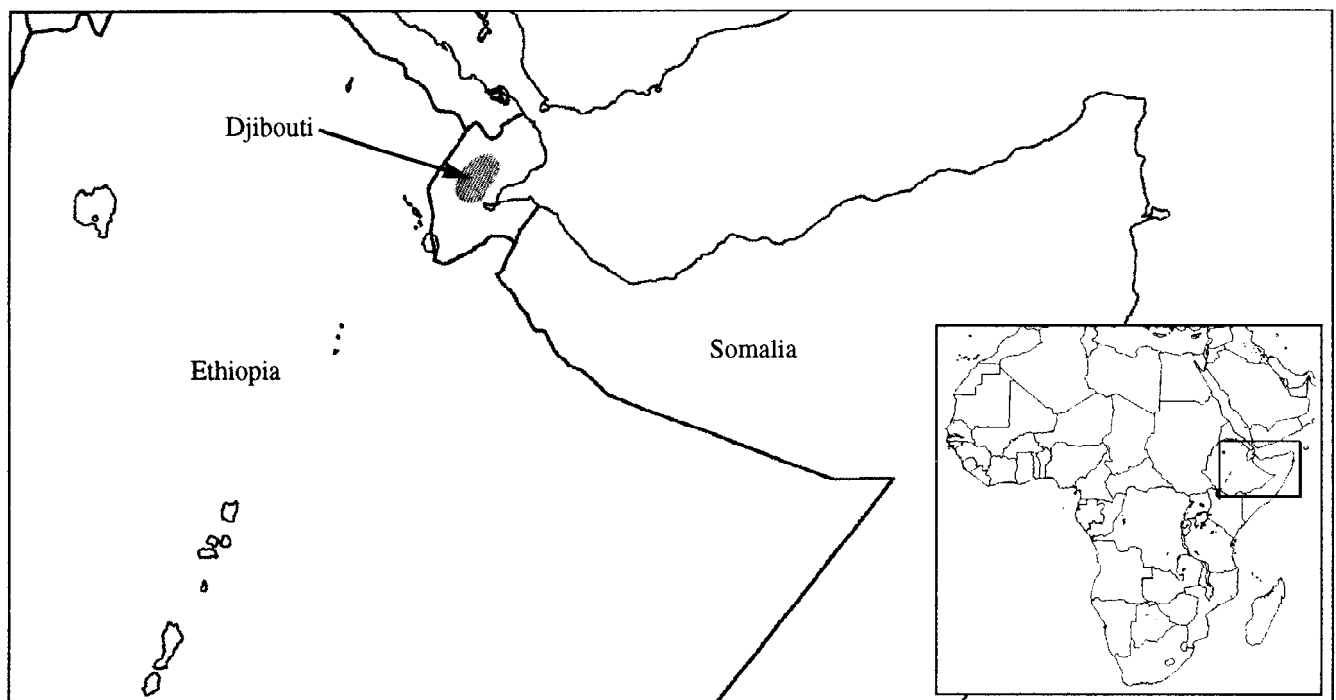
Justification: There are probably fewer than 1000 Djibouti francolins left, all in the Goda and Mabla Mountains of Djibouti. Only 35 square kilometres of habitat is known at two sites, about half of which is in the Forêt du Day National Park, with the other half unprotected. Urgent action is therefore needed to save this bird from extinction.



Project description: A survey should be conducted of all remaining areas of habitat (primary and secondary forest

Djibouti francolin

Artist: Hilary Welch



Location of Djibouti francolin distribution

Conservation of the Djibouti francolin in Djibouti

above 700 m) to determine density and degree of fragmentation of the population. This should be carried out during the early part of the breeding season (December to March). Further, more extensive surveys could be carried out to assess habitat utilisation, feeding behaviour and breeding biology using wing-tagging to allow individual recognition. Protected area status is urgently needed for the areas of population outside the Forêt du Day National Park, such as in the Mabla Mountains. This should be accompanied by education of local people and enforcement of existing wildlife laws. After the survey, a Population and Habitat Viability Assessment (PHVA) should be carried out, either in Djibouti or in France, inviting all present and previous surveyors of this species along with Government officials to set out a population management strategy for the Djibouti francolin.

The execution of at least some aspects of this project is dependent upon the end of civil unrest in Djibouti and neighbouring Somalia.

Time scale: Two to three years.

Budget: Surveys & field research:	\$100,000
Education programme:	\$ 25,000
PHVA	\$ 25,000
<u>TOTAL</u>	<u>\$150,000</u>

Suggested reading:

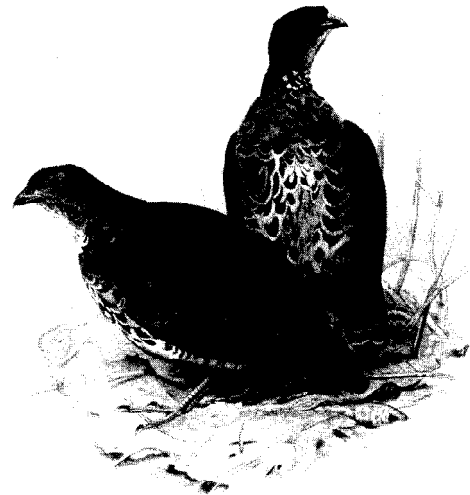
- Crowe, T. M., Keith, L.S. and Brown, L.H. 1986. Galliformes. In: Urban, E. K., Fry, C. H. and Keith, S. (eds.) *The birds of Africa* Vol 2:1-75. Academic Press, London.
- Welch, G. and Welch, H. 1985. Observations on the endemic Djibouti francolin *Francolinus ochropectus* with emphasis on potential threats to the population. *J. World Pheasant Assoc.* 10:65-71.

Survey of the habitat of the recently discovered Udzungwa forest partridge in Tanzania

Mace-Lande status: Vulnerable

Aim: To investigate the ecology, breeding biology, population density and conservation status of the Udzungwa forest partridge *Xenoperdix udzungwensis*, and thus make recommendations that will ensure its conservation.

Justification: This elusive bird was first discovered by a group of Danish biologists on an expedition to the Udzungwa Mountains of Eastern Tanzania (Dinesen *et al.* 1994). Although 246 bird sightings in 85 encounters were made, at present only limited details are known about the ecology of the bird. Because of its highly restricted known range (<300 square kilometres) information on population density and possible threats are urgently needed. Its very small distribution makes the species vulnerable to any changes in habitat use.



Project description: A thorough survey for this species is required, covering the forest area in the Udzungwa Mountains, especially in the area of the Luhombero Forest which lies east of the Ndundulu Mountains, and which has not been surveyed for the species at all. Specimens should be caught if possible (three specimens were caught during the original expedition - Dinesen *et al.* 1994) so that morphological measurements can be taken as well as blood samples for DNA analysis. Information on habitat choice, breeding productivity and feeding ecology is needed from detailed observation work. Meanwhile, the Udzungwa forest National Park needs to be extended to include the Ndundulu and Nyumbanitu mountains which represent the only known range of the species. If the opportunity arises birds might be trapped, measured and released so that the species' systematic position can be fully investigated. This project could be combined with studies of other little-known forest birds in Eastern Tanzania in conjunction with the Eastern Arc Mountains project led by Jon Fjeldså.

Udzungwa forest partridge

Artist: Martin Woodcock

Timescale: Three years minimum.

Budget: About \$50,000

Suggested reading:

Dinesen, L., Lehmborg, T., Svendsen, J.O., Hansen, L.A. and Fjeldså, J. 1994. A new genus of perdicine bird (Phasianidae, Perdicini) from Tanzania; a relict form with Indo-Malayan affinities. *Ibis* 136:3-11.

Summaries of further projects in Africa

4.3.4. Survey of Angolan Francolins

Summary: Surveys are needed to establish the distribution and status of grey-striped francolin *Fringilla griseostriatus* (Mace-Lande; insufficient information) and Swierstra's francolin *F. swierstrai* (Mace-Lande; vulnerable) in Angola. There are no recent data on the status of either of these species, therefore there is an urgent need to survey them and establish whether there are any threats to their continued survival. Such a project would take a minimum of two years and cost up to \$50,000, and would rely on the cessation of hostilities in the region.



Location of range of *F.b.ayesha*

4.3.5. Taxonomic clarification and protection of the Moroccan subspecies of the double-spurred francolin *Francolinus bicalcaratus ayesha*

Summary: The Moroccan population of the double-spurred francolin is about 2000 km from the nearest part of the main range of this species. This and the larger size of the Moroccan subspecies have led to its consideration as a candidate for status as a species in its own right. DNA analysis is urgently needed to resolve this taxonomic question, as the wild population of the Moroccan subspecies now numbers below 1000 (Mace-Lande; endangered). This population is located in a single area (Sidi Bettache) and there is a need to look for any further sites and to ensure their protection. Therefore, both a thorough survey of potential habitat and a laboratory study of double-spurred francolin DNA are required.

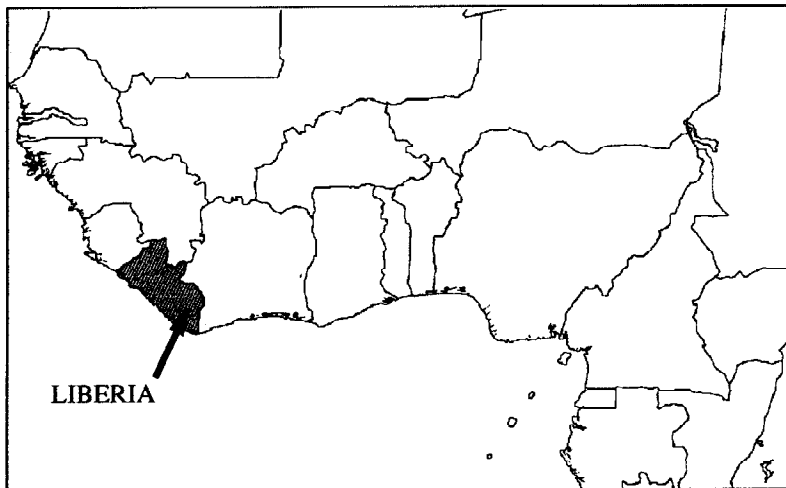
The project would entail one year of intensive studies followed by annual monitoring of the remaining population. DNA work is expensive, so the cost of the project is likely to exceed \$20,000.

4.3.6. Conservation of the Cameroon mountain francolin *Francolinus camerunensis*

Summary: This vulnerable species is restricted to less than 200 square kilometres of primary and secondary montane forest on the south-east slopes of Mount Cameroon and steps need to be taken to ensure that the bird's habitat is fully protected in its limited range. Although the forest has protected status, the project would need to establish the effectiveness of this protection and the extent to which the species is hunted. This would take up to two years and cost between \$10,000 and \$20,000.

4.3.7. Conservation of the Madagascar partridge *Margaroperdix madagarensis* in Madagascar

Summary: Recent anecdotal evidence suggests that there has been a marked decline of this vulnerable species since the 1930s and survey work is needed to establish whether this is continuing and, if so, determine the causes. The impact of hunting, habitat change and agricultural developments on the species could also be investigated. The project would be ideal for a Malagasy postgraduate student, taking two to three years and costing \$10-20,000.



Location of the range of *A. meleagrides* in Liberia

4.3.8. Conservation of the white-breasted guineafowl *Agelastes meleagrides* in Liberia

Summary: Despite some previous work on this vulnerable species, its distribution in parts of its known range is poorly known and a project is needed to establish its population density in Liberia and establish new protected areas if needed. The project would probably require a full time researcher/field officer to work closely with Wildlife Departments and would take two to three years.

4.3.9. Taxonomic clarification and protection of the Moroccan subspecies of the Helmeted guineafowl *Numida meleagris sabyi*

Summary: This subspecies, classified as critical using the Mace-Lande criteria, is geographically separated from the rest of the species' range by over 1000 square kilometres. It is very poorly known, though believed to be present in an area between the Oum er Rbia and Sebou rivers in the north-west of the country. A thorough survey of all former sites and other suitable habitat around them is required. If possible, trapping of wild birds should be attempted in order to collect small blood samples for DNA analysis to determine whether the taxon merits species status. Protected area status should be sought for the location of any wild populations. The project would take one to two years and cost up to \$25,000.

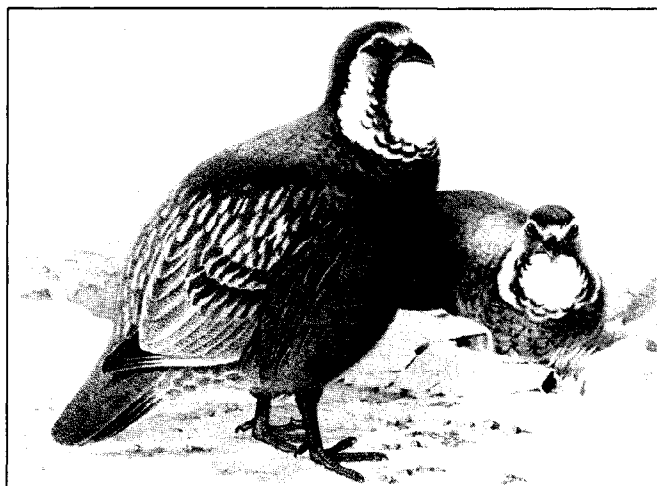
Survey of Caspian snowcock

Tetraogallus caspius in Turkey, Armenia, Azerbaijan and Iran

Mace-Lande status: Vulnerable

Aim: To clarify the distribution and range of the Caspian snowcock, determine its population density and establish the nature of any threats to its survival.

Justification: Inaccessibility of the native range of this species has led to poor knowledge of its current population status. The most recent estimates are of about 850 individuals in the Transcaucasian mountains of Armenia and Azerbaijan in 1964, where it is believed to be declining (Bannikov 1978), and 200-2000 estimated to be in the Turkish part of its range (ICBP unpub. data) and 7,000-8,000 in north-west Iran (Roald Potapov in litt.). War in parts of its native range and suggestions of decline give grave cause for concern for this highly restricted range species and hence the need for more detailed and up-to-date information.



Caspian snowcock

Artist: Henry Jones

Project description: The main problem with this project is that three of the four nations included in the range of the species (Armenia, Azerbaijan and Iran) appear difficult for fieldwork. The project might

therefore concentrate initially on Turkey, with efforts made by the principal investigator to contact researchers in the other countries concerned in order to encourage surveys by nationals using standard techniques. In Turkey, all suitable areas (mountain slopes above 2400 m) within the known range of the species need to be surveyed in order to establish the presence or absence of Caspian snowcock and, if present, the population density. Where sizeable populations are found, details of habitat preferences should be gathered as well as information on agricultural and hunting activities and how these might affect the birds (both positively and adversely). Surveys would be done in spring and summer to determine breeding density and reproductive success. Particular attention should be given to the two



Caspian snowcock winter habitat Photo: Yuriy Lukyanvo
Reproduced from the booklet *The Altai Snowcock*

Survey of Caspian snowcock in Turkey, Armenia, Azerbaijan and Iran

protected areas of Kayseri-Yahyali and Tunceli-Cemishezek (Serez 1992) to determine population sizes of Caspian snowcock in these areas and establish whether the protection being given is effective. Consideration should be given to whether further protected areas need to be established along with appropriate management recommendations for such areas.

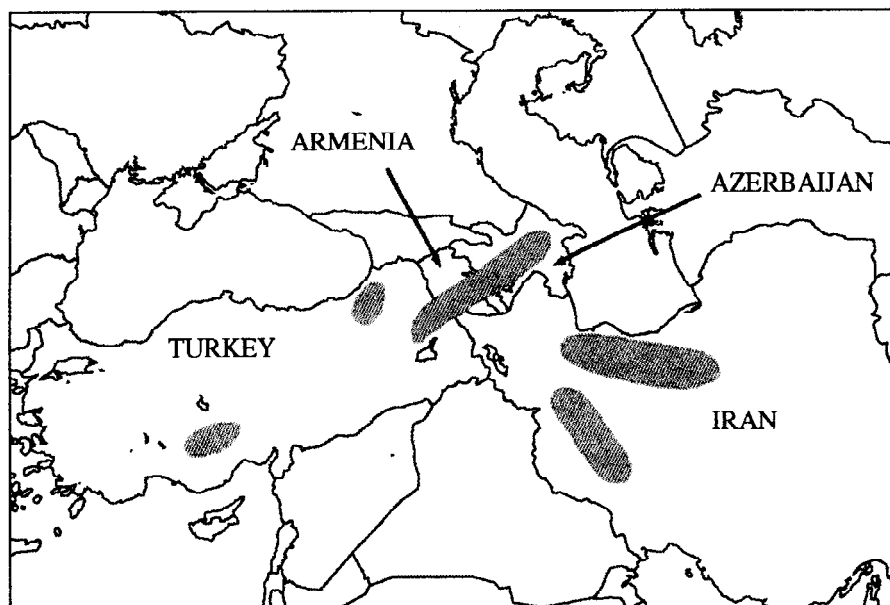
In the longer term, every effort should be made to encourage surveys and further investigation into the populations of this species in Iran, Armenia and Azerbaijan as and when the political situations in those countries allow. Researchers on this project could also conduct surveys of the Caucasian blackcock *Tetrao mlokosciewiczii* where its range overlaps as this is another poorly-known galliform species restricted to this part of the world.

Timescale: Two to three years.

Budget: \$25,000-\$50,000

Suggested reading:

- Bannikov, A.G. (ed.) 1978. *Red Data Book for the USSR*. USSR Ministry of Agriculture, Moscow, (in Russian).
- Potapov, R. 1992. Adaptation to mountain conditions and evolution in snowcocks (*Tetraogallus* sp.). In: Birkan, M., Potts, G.R., Aebischer, N.J. and Dowell, S.D. (eds.) *Perdix VI, First International Symposium on Partridges, Quails and Francolins. Gibier Faune Sauvage* 9:647-660.
- Serez, M. 1992. Status, distribution and ecology of some phasianid species in Turkey. In: Birkan, M., Potts, G.R., Aebischer, N.J. and Dowell, S.D. (eds.) *Perdix VI, First International Symposium on Partridges, Quails and Francolins. Gibier Faune Sauvage* 9:523-526.



Location of survey areas for Caspian snowcock

Survey and habitat management of the swamp francolin *Francolinus gularis* in India

Mace-Lande status: Vulnerable

Aim: To ensure the long-term conservation of the swamp francolin by: a) providing information on its status in the Indian part of its range; b) comparing habitat use on unprotected agricultural land with that in a fully protected area; and c) making appropriate management recommendations to the state and central governments.

Justification: The swamp francolin *Francolinus gularis* is distributed throughout North India, Bangladesh and Nepal, where it inhabits *terai* grassland (tall grasses and swamps from 50-200 m). Populations are believed to be highly fragmented due to its specific habitat requirements. It is regarded as threatened with extinction due to changing land use patterns in the *terai* region of India and Nepal (Collar and Andrew 1988; Johnsgard 1988). Much of its habitat is being converted to agricultural land. The species is considered vulnerable to extinction because of uncertainty over the relationship between its use of habitat and current land-use practices throughout the *terai*.



Swamp francolin

Photo: Perwez Iqbal



Swamp francolin habitat, Dudwa National Park, India

Photo: Philip McGowan

Project description: The project is divided into three sections as follows:

1. Assessment of the status of the swamp francolin in India - some information has been collected on the distribution of the species in the Indian *terai* by Sàlim Javed and Asad Rahmani (1991) and by Rahul Kaul and Rajiv Kalsi (1990). During these surveys, a number of swamp francolin localities have been identified and the human disturbance at each site has been qualitatively assessed. The surveys have also revealed the need for a systematic assessment of the species' status within and without protected areas. This is necessary because the species

Survey and habitat management of the swamp francolin in India

may exist in more localities than previously suspected, but many of these may be isolated and prone to high levels of disturbance.

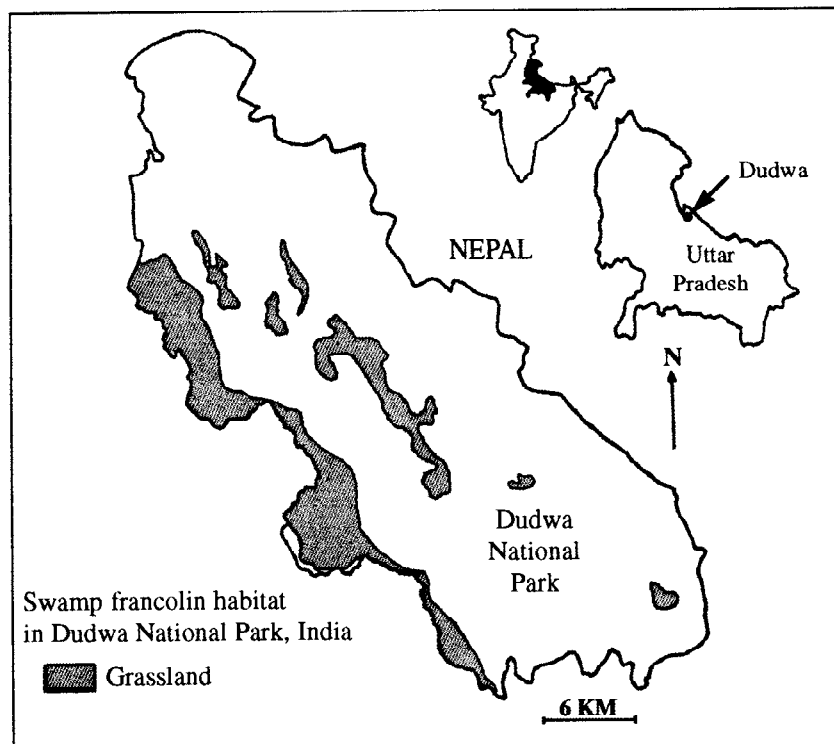
2. Habitat use - The surveys noted above found that the species inhabits sugar cane fields around marshy areas as well as undisturbed tall, wet grassland. Preliminary fieldwork conducted during March/April 1993 (McGowan *et al.* in prep) suggested that the species may be more common in areas where cane fields surround marshes than in undisturbed grassland around marshes. No direct quantitative comparison was conducted, however. This part of the study, therefore, requires that the pattern of habitat use is analysed in both protected and agricultural areas. Specific objectives will be to compare the density of birds and assess breeding success in the two areas.
3. Proposal of management recommendations - once patterns of habitat use have been established, appropriate recommendations for the management of swamp francolin habitat within and around protected areas will be made to relevant state and central governments.

Time scale: Three years

Budget: \$5,000-\$10,000

Suggested reading:

- Collar, N.J. and Andrew, P.A. 1988. *Birds to watch: the ICBP world checklist of threatened birds*. International Council for Bird Preservation, Cambridge.
- Johnsgard, P.A. 1988. *Quails, Partridges and Francolins of the World*. Oxford University Press, Oxford.
- Kaul, R. and Kalsi, R. 1990. Swamp partridge - a pilot survey. *WPA News* 30:3-5.
- Javed, S. and Rahmani, A.R. 1991. Swamp francolin in the North Indian terai. *WPA News* 34:15-18.

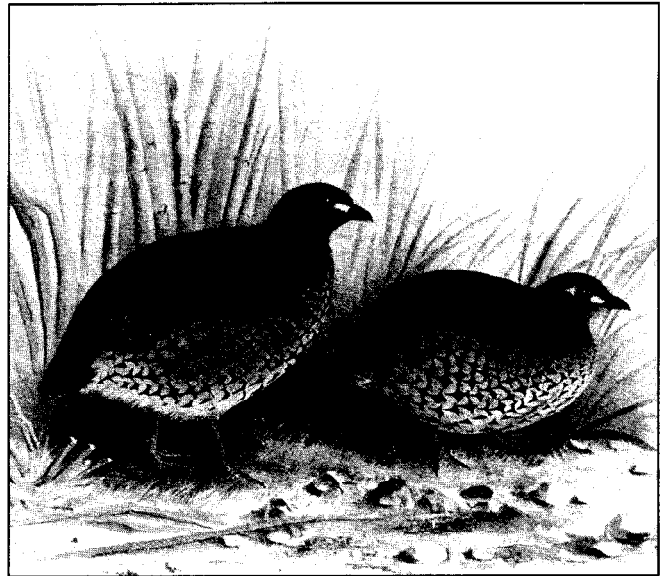


Survey of the endangered Manipur bush-quail *Perdicula manipurensis* in north-east India

Mace-Lande status: Endangered

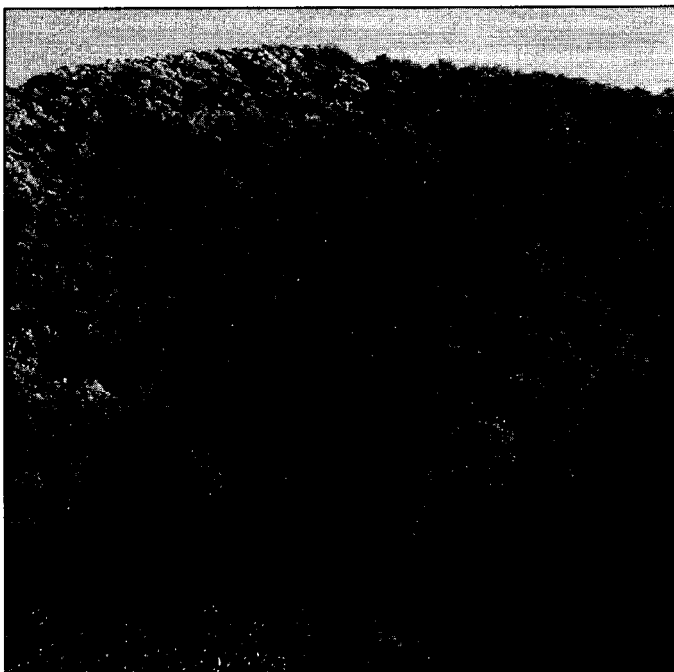
Aim: To determine the distribution and status of the Manipur bush-quail by surveying all potentially suitable habitat in north-east India.

Justification: The Manipur bush-quail *Perdicula manipurensis* is a poorly known inhabitant of wet grassland in north-east India (Collar and Andrew 1988) and it may still occur in the Chittagong Hill Tracts in Bangladesh (Harvey 1990). In north-east India, it has been reported up to about 1,000 m in northern West Bengal, Assam and the hills south of the Bangladeshi border from Megalaya and Nagaland south to Manipur (Ali and Ripley 1983). The Biodiversity Project (ICBP 1992) lists 10 records (all pre-1910) of the species (unpub. data), mostly from the Manipur Basin, where it was formerly shot. It is believed to have become scarcer in the Manipur Basin since the 1930s (Higgins, in Ali and Ripley 1983) and has suffered from loss of its swampy habitat through drainage for agriculture. There appear to be no recent records.



Manipur bush-quail

Artist: Henry Jones



Manipur bush-quail habitat

Project description: Surveys are needed to determine where the species still occurs, its status and the threats to its continued survival. These surveys should visit former localities including the eastern hills of Manipur, the south of the Manipur Basin, the area around Phalel and just north-west of Imphal and around Goalpara in Assam. Whilst some parts of north-east Bangladesh contain extensive areas of grassland which might be suitable in the dry season, they are under water for two-thirds of the year (Paul Thompson *in litt.*). Survey methods must be carefully chosen as the species may easily be overlooked until its characteristic call is learnt (Ali and Ripley 1983) and, as with the swamp francolin (see project 4.5.1.), listening for birds at dawn and dusk may prove the best method for locating birds. The species

Survey of the endangered Manipur bush-quail in north-east India

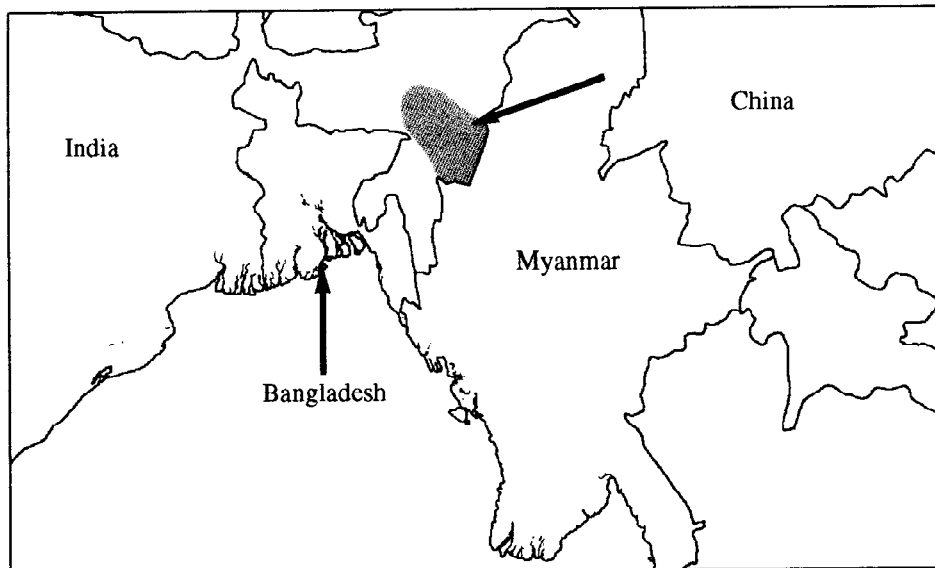
is also reported to emerge from dense wet grassland early in the morning to feed in open patches (Ogilvie-Grant 1896), and is very difficult to flush. Indeed, Ogilvie-Grant (1896) states that it took Hume two days and the employment of about a hundred beaters to secure his specimens (two coveys, one of five and one of six birds) from a patch of elephant grass about two miles square.

Time scale: Three years

Budget: \$5,000-\$10,000

Suggested reading:

- Ali, S. and Ripley, S.D. 1983. *Handbook of the birds of India and Pakistan*. Compact edition. Oxford University Press, Delhi.
- Collar, N.J. and Andrew, P.A. 1988. *Birds to watch: the ICBP world checklist of threatened birds*. International Council for Bird Preservation, Cambridge.
- Harvey, W.G. 1990. *Birds in Bangladesh*. University Press, Dhaka, Bangladesh.
- Ogilvie-Grant, W.R. 1896. *A handbook to the game-birds: volume I*. Edward Lloyd Ltd, London.



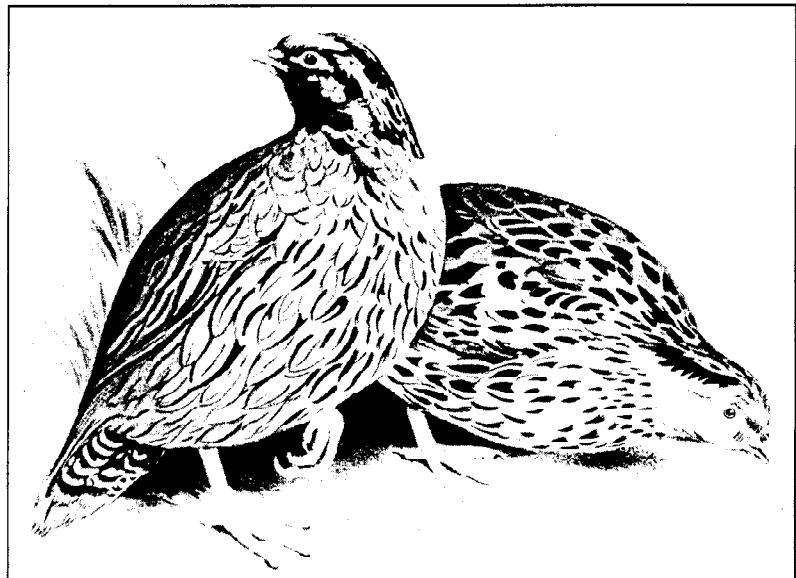
Range of distribution of *P. manipurensis*

Search for the Indian mountain quail *Ophrysia superciliosa* in the Indian Himalaya

Mace-Lande status: Extinct/Critical

Aim: To determine whether the Indian mountain quail still survives in its Himalayan range by revisiting its historic localities and other potential sites.

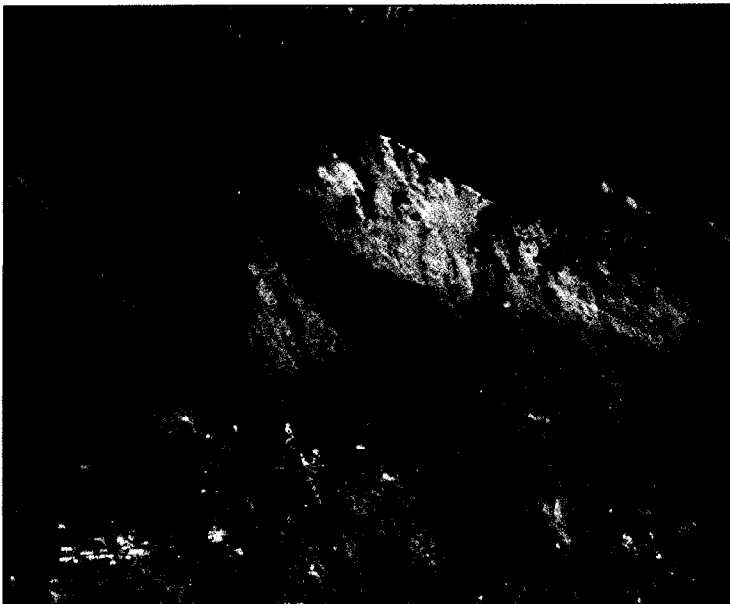
Justification: This species, also commonly known as the Himalayan quail (see Collar and Andrew 1988), is known from only nine specimens collected over 100 years ago in the hills of Uttar Pradesh in India (Rieger and Walzthöny 1992). All but one of these specimens were shot between November and January (Ali and Ripley 1983). The former sites and those which look similar have been visited recently, and despite searches the species has not been recorded (e.g. Sankaran 1990). In most of the Indian mountain quail's former range, the grassy slopes are over-grazed and degraded by quarrying. Reference to Ogilvie-Grant (1896), however, offers some hope. Whilst he states that the species is very



Indian mountain quail

Reproduced from Hume and Marshall Vol. II *The gamebirds of India, Burma and Ceylon*

rare, he considers that it is undoubtedly a migrant from Tibet, although one specimen in the British Museum at Tring was collected at Jharipani above Mussorie in June 1870. Ogilvie-Grant (1896) asserts that the birds rarely leave thick grass and scrub and that they cannot be flushed without using dogs. In addition, there have been a number of unconfirmed reports of this species in the last forty years (e.g. Ripley 1952; Negi 1992).



Indian mountain quail believed habitat

Photo: Peter Garson

Project description: Surveys are needed to determine whether the species still exists. These surveys should visit former localities in Uttar Pradesh, including: Bhadraj and Banog Peaks behind Mussorie (around 2100 m altitude), Jharipani (1650

Search for the Indian mountain quail in the Indian Himalaya

m altitude) above Dehra Dun and Sher-ka-danda near Naini Tal (Ali and Ripley 1983). Other potential areas could be identified through a media campaign.

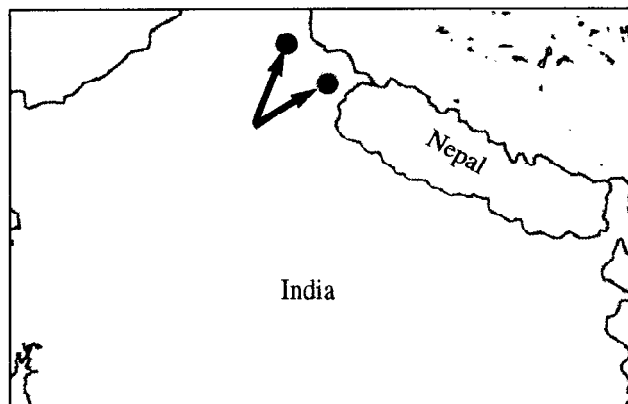
All but one of the specimens collected in the nineteenth century were obtained outside the breeding season and no advertisement call by males in the breeding season was described. Therefore any survey should be conducted between November and January and use trained dogs to try and flush any birds from areas of grass and brushland on steep hillsides. If successful, every effort should be made to catch one or two specimens for confirmation of identification, photography and ringing. Any such specimens should be released back into the wild immediately.

Time scale: Two years

Budget: <\$5,000

Suggested reading:

- Ali, S. 1977. President's letter: 'Mystery' birds of India: Mountain Quail. *Hornbill* 1977 (3):3-5.
- Ali, S. and Ripley, S.D. 1983. *Handbook of the birds of India and Pakistan*. Compact edition. Oxford University Press, Delhi.
- Collar, N.J. and Andrew, P.A. 1988. *Birds to watch: the ICBP world checklist of threatened birds*. International Council for Bird Preservation, Cambridge.
- Negi, I.S. 1992. Is the Mountain Quail extinct? *Cheetal* 31:1-2.
- Ogilvie-Grant, W.R. 1896. *A handbook to the game-birds: volume I*. Edward Lloyd Ltd, London.
- Rieger, I.G. and Walzthöny, D. 1992. The distribution of the mountain quail *Ophrysia superciliosa* in the last century. In: Birkan, M., Potts, G.R., Aebischer, N.J. and Dowell, S.D. (eds.) *Perdix VI, First International Symposium on Partridges, Quails and Francolins*. *Gibier Faune Sauvage* 9:585-590.
- Ripley, S.D. 1952. Vanishing and extinct bird species of India. *Journal of the B.N.H.S.* 50:902-906.
- Sankaran, R. 1990. *The Indian mountain quail: a preliminary survey*. In: Status and ecology of the lesser and Bengal floricans with reports on Jerdon's courser and Mountain quail: final report:135-137. Bombay Natural History Society, Bombay.



Conservation of the Sichuan hill-partridge *Arborophila rufipectus* in China

Mace-Lande status: Critical

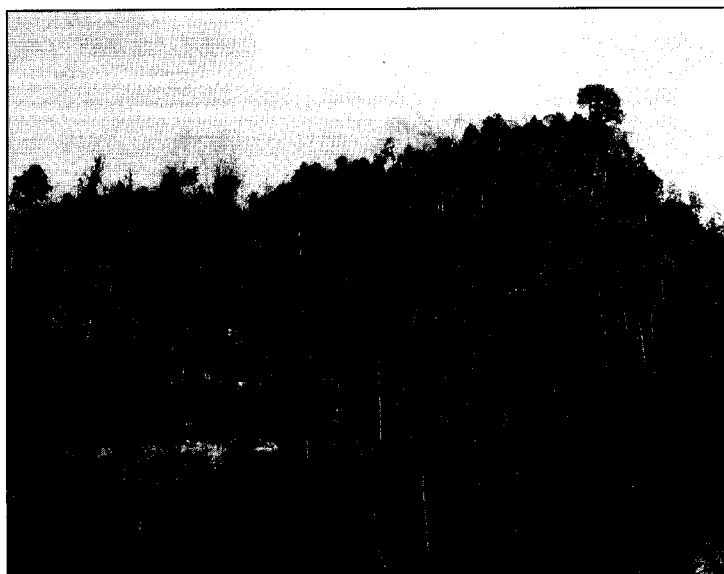
Aim: To ensure the long-term conservation of the Sichuan hill-partridge by assessing its distribution, promoting the notification of a protected area and understanding its reaction to habitat disturbance resulting in the implementation of appropriate management practices.

Justification: The Sichuan hill-partridge is believed to be restricted to a small range of less than 100 square kilometres in Sichuan province, south-west China, where it inhabits sub-tropical evergreen forest and woods usually below 2,500 m. It is, therefore, a Restricted Range Species and occurs in Endemic Bird Area D14 which is the South China forests and is a Priority II Endemic Bird Area (ICBP 1992). The total population is estimated at about 1,000 individuals and may be declining due to loss of its primary forest habitat. It is spread across five counties in Sichuan province: E'bian, Mabian, Pingshan, Ganluo and Muchuan. It may also be present in another two counties, namely Leipo and Meigu and possibly in the extreme north-east of Yunnan province. Of immediate concern is the



Sichuan hill-partridge

Artist: David Mead



Sichuan hill-partridge habitat

Photo: Simon Dowell

establishment of at least one protected area for the species as there is a complete lack of protection for any of these populations. Recent studies by He Fen-qi indicate that the loss and degradation of habitat followed by artificial re-planting is having a major effect. However, recent reports from forestry workers suggest that the species may be able to survive in some of the conifer plantations that are replacing the natural forest, depending upon how they are managed.

Project description: The Sichuan hill-partridge does not occur in any protected area and inhabits a habitat type that is currently being altered by the extraction of timber.

Conservation of the Sichuan hill-partridge in China

A three-fold project is proposed:

- 1) A thorough survey should be carried out in all remaining forest blocks in the seven counties noted above, as well as in neighbouring areas, to ascertain the status and distribution of the species. It is important to attempt estimation of the size of each population and its degree of isolation.
- 2) Attempts should be made to promote the notification of at least one protected area containing suitable forest and a large population of the species. The Mt. Huanglian population has recently been visited by He Fen-qi and the economic and conservation situation in the area noted (He 1992). A second block of forest, comprising 13.5 square kilometres of well preserved primary evergreen forest has been identified in the south-east of the fifth district, Mabian county. This forest may contain the Sichuan hill partridge and is not likely to be exploited until the turn of the decade. Consequently, protection of this forest might serve to conserve the partridge whilst not adversely affecting the local economy.
- 3) Research should be conducted to determine the species' reaction to habitat alteration. The partridge has been found in secondary forest (He 1992), but more information on the use of this habitat and of forestry plantations is desperately needed before appropriate management recommendations can be made. Secondary forest often refers to forests in a wide range of degraded states and so the limit of habitat alteration that the species can tolerate must be established. In addition, primary forest adjacent to secondary forest may be a requirement for some activities, such as breeding. A detailed study would need to address these points and propose management recommendations to ensure the long-term survival of the Sichuan hill-partridge.

Time scale: Three years

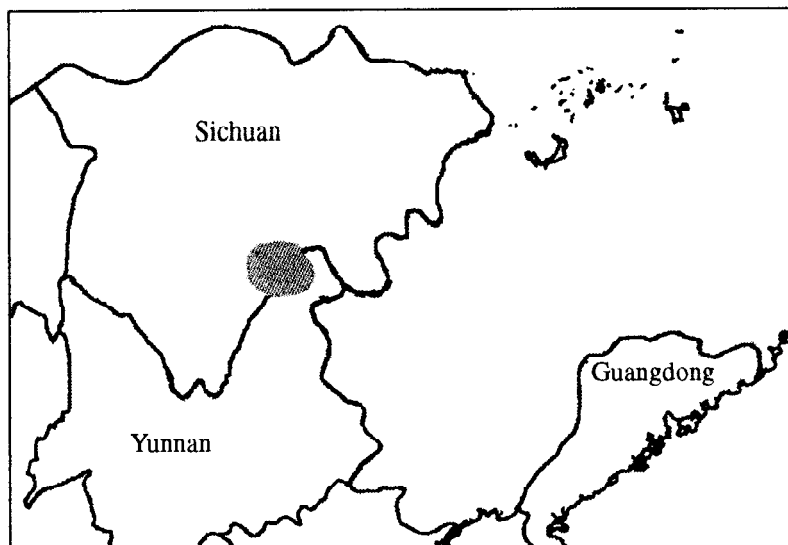
Budget: Surveys:	\$5000 - \$10,000
Management Plan	\$5,000 - \$10,000
Detailed research	\$25,000 - \$50,000
<u>TOTAL</u>	<u>\$35,000 - \$70,000</u>

Suggested reading:

Collar, N.J. and Andrew, P.A. 1988. *Birds to watch: the ICBP world checklist of threatened birds*. International Council for Bird Preservation, Cambridge.

He, F. Q. 1992. Conservation of the Sichuan hill partridge in China. *PQF News* 2 (July 1992):7. [Obtainable from the Editor, PQF News, The Allerton Trust, Loddington House, Loddington, Leicestershire, UK.]

I.C.B.P. 1992. *Putting biodiversity on the map: priority areas for global conservation*. International Council for Bird Preservation, Cambridge.



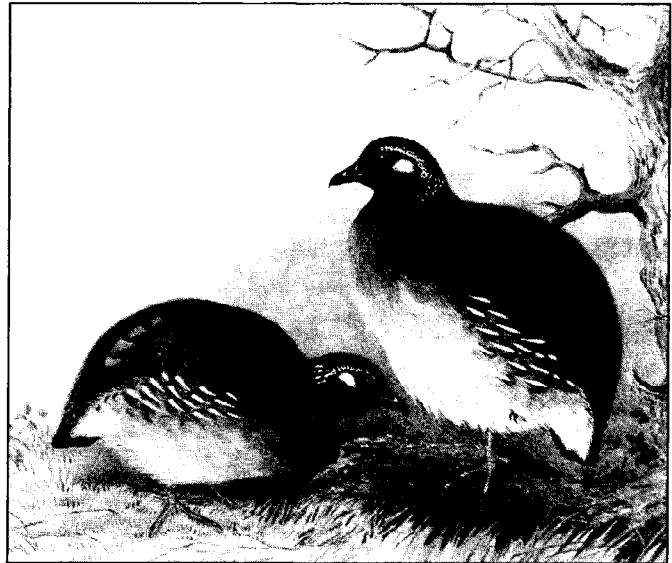
Conservation of the white-eared (Hainan) hill-partridge *Arborophila ardens* in Hainan, China

Mace-Lande status: Endangered

Aim: To ensure the long-term conservation of the white-eared (Hainan) hill-partridge on Hainan island.

Justification: The white-eared (Hainan) hill-partridge is believed to be endemic to the central areas of Hainan island (Collar and Andrew 1988; Johnsgard 1988), where it is known from five counties. It may occur in two more counties on the island and in two counties in southern Guangxi (He Fen-qi *in litt.*). The species is not definitely known from any protected area (He Fen-qi *in litt.*), although it is reported from Ba Wang Ling Reserve (Gao Yuren *in litt.*) and is threatened by habitat loss as a result of timber extraction and conversion of forest to agricultural land and degradation of other patches of suitable habitat. The species is considered a "First Class Protected Animal Species" in China.

This project could be combined with surveys of two endangered pheasant subspecies, the Hainan subspecies of the grey peacock-pheasant *Polyplectron bicalcaratum katsumatae* and the Hainan subspecies of silver pheasant *Lophura nycthemera whiteheadi* see the Pheasant Conservation Action Plan.



Hainan hill-partridge

Artist: Henry Jones



Captive Hainan hill-partridge

Photo: Simon Dowell

Project description: The project should be carried out in four stages:

1. An assessment of the distribution of the Hainan hill-partridge, Hainan grey peacock pheasant and Hainan silver pheasant on Hainan and in southern Guangxi should be made. All remaining areas of suitable habitat throughout their range should be visited and the presence or absence of birds established by call surveys (Hainan hill-partridge) and by flushing surveys (the two pheasant taxa, neither of which are especially vocal). During these visits the broad-scale habitat use should be determined at each site and human disturbance assessed.

Conservation of the white-eared (Hainan) hill-partridge in Hainan, China

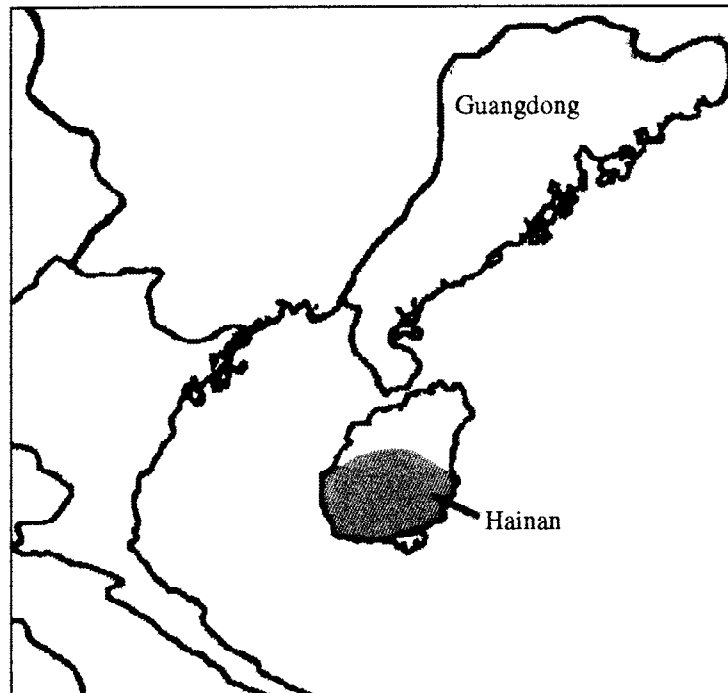
2. Based on the results of these surveys, all efforts should be made to secure remaining habitat for long-term protection.
3. At the same time that habitat protection is being vigorously promoted a detailed study of habitat use by these three galliform taxa should be conducted and population density assessed. This will be done at one site, probably Ba Wang Ling Nature Reserve, and will focus on the pattern of use of all habitat types within the Reserve. The study should assess the extent to which the species tolerates alteration and disturbance of the habitat and attempt to assess the density of birds at the site.
4. Once patterns of habitat use have been established, appropriate recommendations for the management of Hainan hill-partridge habitat within protected areas, and outside, will be made to relevant provincial and central governments.

Time scale: Three years

Budget: \$5,000 - 10,000

Suggested reading:

Collar, N.J. and Andrew, P.A. 1988. *Birds to watch: the ICBP world checklist of threatened birds*. International Council for Bird Preservation, Cambridge.



Location of Hainan hill-partridge project

Summaries of further projects in China, including Taiwan

4.6.3. Surveys of the white-throated (Taiwan) hill-partridge *Arborophila crudigularis* in Taiwan

Summary: Surveys of temperate broadleaf and mixed forest in the central mountain ranges of Taiwan are required to establish the current population status of this vulnerable species. The effectiveness of protected areas in ensuring its survival needs to be determined.

4.6.4. Conservation of the collared hill-partridge *Arborophila gingica* in China

Summary: Although classified as endangered using Mace-Lande criteria, there is some dispute as to whether this species is quite so threatened. The decline in available habitat (montane forest) suggests that a population decline may have followed and, therefore, surveys of remaining habitat in the Fujian Mountains and north Guangdong are needed to determine its current status.

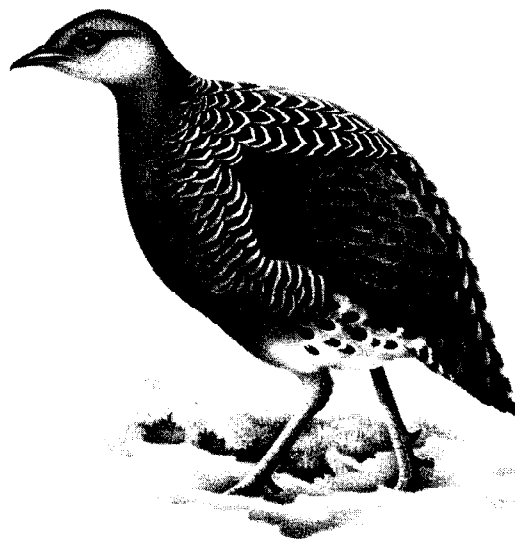
Establishing conservation priorities for Galliformes on Sumatra, Indonesia

Mace-Lande status: One critical taxon and six vulnerable taxa.

Aim: To promote the conservation of Sumatran Galliformes by a) determining what conservation and research initiatives are currently underway so that beneficial links can be established; and b) proposing and carrying out surveys to complement these initiatives in areas not already covered.

Justification: Knowledge of the status of Indonesian Galliformes is poor (Holmes 1989). The country has the longest list of birds which are believed to be threatened with extinction (Collar and Andrew 1988), but in many cases this reflects presumed population pressures resulting from habitat loss, rather than direct evidence of declines in numbers. Nonetheless, the threats facing Indonesia's biodiversity are very real, and the present lack of baseline information prevents any accurate assessment of the conservation situation and the proposal of appropriate conservation measures. Consequently, all existing information relating to the conservation of these birds must be collated and assessed before any specific actions are proposed.

The Sumatran subspecies of the scaly-breasted hill-partridge *A. c. atjenensis* is one of the most threatened partridge taxa in the world. Further information is needed concerning both its taxonomy and conservation requirements. This subspecies is geographically isolated from other populations of the species. Whilst the validity of the subspecies has been questioned (Gerlof Mees *in litt.*), the species as a whole is clearly in need of attention on Sumatra, where it is only known from the type locality in lowland north-east Aceh (north Sumatra) and from specimens collected in Lampung (south Sumatra), the last of which was taken in 1939 (van Marle and Voous 1988). In addition, the Peninsular Malaysia and Sumatran group of bare-throated hill-partridge subspecies *Arborophila orientalis rolli/sumatrana/campbelli* have not been recorded from any protected area in Sumatra.



Ferruginous wood-partridge *C.o.sumatrana*

Artist: David Mead

Reproduced from *Pheasants, Partridges and Grouse* by kind permission of Christopher Helm (Publishers) Ltd.



Black wood-partridge

Artist: Henry Jones

Establishing conservation priorities for Galliformes on Sumatra, Indonesia

Project description: The island of Sumatra covers 476,000 square kilometres. Establishing the conservation status and, therefore, the needs of Galliformes over such a vast area is not easy. Therefore, a co-ordinated picture of on-going conservation projects is required so that a realistic evaluation of the conservation needs of the island's Galliformes can be made and then promoted within these projects. Where initiatives are lacking, field surveys should be initiated to collect appropriate data.

Several areas have already been identified as potentially important for the long-term survival of Sumatra's Galliformes and some are believed to be the sites of conservation projects already. The first step is to determine which sites may be important to galliform conservation and to assess the level of conservation activity at each. The relative merits of each site can then be considered and some priorities established. On this basis, more appropriate conservation measures should be proposed and these might take one of two forms. Where there is an existing conservation effort, it may be appropriate to promote more consideration of galliform species within the aims of each programme. Where there are no such programmes, the first step is likely to be to conduct baseline surveys.

As the distribution and habitat requirements of Sumatra's birds is still poorly known, a list of priority sites will need to be compiled so that surveys can concentrate on collection of appropriate data from the most important sites. When this list has been drawn up, initiation of surveys in key areas is required. Such surveys should be broad-based, covering the whole spectrum of the forest avifauna, but concentrating on Galliformes and other threatened species (*e.g.* raptors, hornbills and some pigeons). Tolerance of habitat degradation by the target species should be evaluated whenever possible. The areas for which further information on both galliform distributions and conservation initiatives is required include;

1. Gunung Leuser National Park (7,927 square kilometres). This National Park contains both lowland and montane forest. Lowland forest is present in the north east corner, at the western end, and also at Singkil Barot. A search for the scaly-breasted hill-partridge in the north-east Aceh foothills should begin in the north-east corner of Gunung Leuser National Park. Such a survey will probably rely heavily on recognition of the calls and, therefore, familiarity with the sub species' calls is required. The long-billed wood-partridge *Rhizothera longirostris*, black wood-partridge *Melanoperdix nigra*, red-billed hill-partridge *Arborophila rubirostris*, ferruginous wood-partridge *Caloperdix oculea* and the crested wood-partridge *Rollulus roulroul* are recorded from this park, but their conservation requirements at this site are not known.
2. Kerinci-Seblat (more than 16,000 square kilometres)/Sumatra Selatan (3,568 square kilometres). This is a complex of protected areas including Rawas/Ulu Lakitan, Bukit Dingin/Gunung Dempo and Bukit Balai Rejang. Kerinci-Seblat contains two partridge species, the red-billed hill-partridge and the ferruginous wood-partridge. These southern reserves have never been surveyed, and Sumatra Selatan is especially worthy of attention. This reserve is part lowland and part hilly and may still be rich in bird species.
3. Siberida proposed reserve (1,200 square kilometres). This is a very important area in the lowlands/low hills.

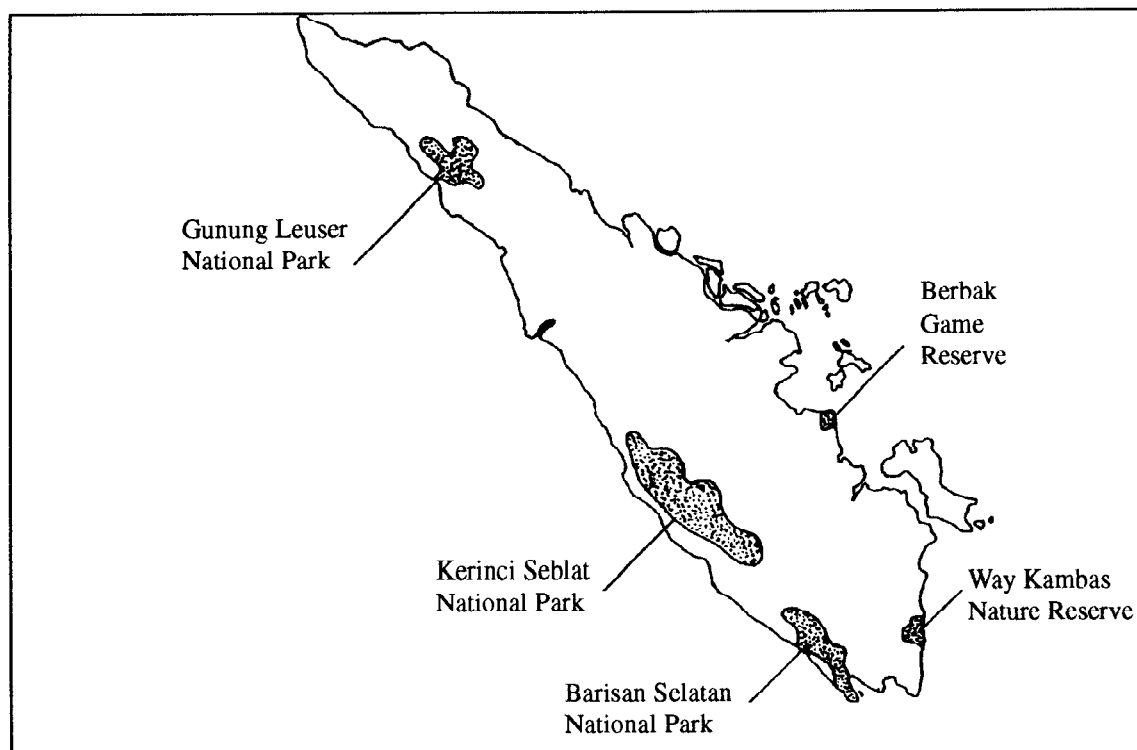
Establishing conservation priorities for Galliformes on Sumatra, Indonesia

4. Berbak Nature Reserve (1,900 square kilometres). This area has been surveyed, but not thoroughly. Berbak and Kerumutan (1,200 square kilometres) both contain swamp forest and may not be suitable habitat for lowland partridges, except for the black wood-partridge.
5. Benteugan (193 square kilometres) is a forest on poor soils that has not yet been surveyed.
6. Way Kambas National Park (1,300 square kilometres). This is a severely degraded forest, which has been surveyed to some extent. The scaly-breasted hill-partridge has so far not been recorded there, but it remains a possible site. The long-billed wood-partridge and the crested wood-partridge are reported from this park, but their conservation requirements at this site are not known.

Time scale: Compilation of information on current work should be conducted during 1995 and assessed during early 1996, when priorities for field surveys can be drawn up. One or two such surveys can then be initiated between mid-1996 and 1999.

Suggested reading:

- van Balen, S. and Holmes, D.A. 1993. Status and conservation of pheasants in the Greater and Lesser Sundas, Indonesia. In: Jenkins, D. (ed.) *Pheasants in Asia 1992* pp 40-49.
- Collar, N.J. and Andrew, P.A. 1988. *Birds to watch: the ICBP world checklist of threatened birds*. International Council for Bird Preservation, Cambridge.
- Holmes, D.A. 1989. Status report on Indonesian Galliformes. *Kukila* 4:133-143 [Also published in *J. World Pheasant Assoc.* 15 and 16:30-44. (1992)].



National Parks and Reserves on Sumatra

Assessing conservation priorities for forest Galliformes on Borneo

Mace-Lande status: One endangered taxon and six vulnerable taxa.

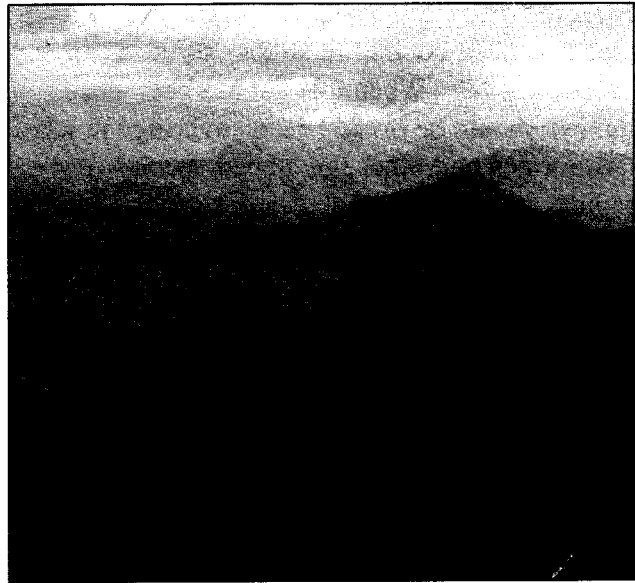
Aim: To promote the conservation of Bornean Galliformes by a) determining what conservation and research initiatives are currently underway so that beneficial links can be established; and b) proposing and carrying out surveys to complement these initiatives in areas not already covered.

Justification: Knowledge of the status of Indonesian Galliformes is poor (Holmes 1989). The country has the longest list of birds which are believed to be threatened with extinction (Collar and Andrew 1988), but in many cases this reflects presumed population pressures resulting from habitat loss, rather than direct evidence of declines in numbers. Nonetheless, the threats facing Indonesia's biodiversity are very real, and the present lack of baseline information prevents an accurate assessment of the conservation situation and the proposal of appropriate conservation measures. Consequently, all existing information relating to the conservation of these birds must be collated and assessed before any specific actions are proposed.

The long-billed wood-partridge *Rhizothera longirostris* and the crimson-headed wood-partridge *Haematortyx sanguiniceps* have not been recorded from protected areas in Kalimantan, although the former is known from several protected areas in Malaysia and is suspected at two in Thailand, and the latter is known from Gunung Mulu National Park in Sarawak, East Malaysia. The Sabah subspecies of the scaly-breasted hill-partridge *Arborophila charltonii graydoni* and the ferruginous wood-partridge *Caloperdix oculea* have not been recorded from Kalimantan but should be searched for.

Project description: The island of Borneo covers 755,000 square kilometres and encompasses three countries: Indonesia (Kalimantan), Malaysia (Sabah and Sarawak) and Brunei. Establishing the conservation requirements of Galliformes over such a vast area is not easy. Therefore, as in the previous project on Sumatran Galliformes, a co-ordinated picture of on-going conservation efforts is required so that a realistic evaluation of the conservation needs of the island's Galliformes can be made and then promoted within such projects. Where initiatives are lacking, field surveys should be initiated to collect appropriate data.

Several areas have already been identified as potentially important for the long-term survival of Borneo's Galliformes, and some are believed to be the sites of conservation projects already. The first



Undisturbed forest, north Borneo

Photo: Philip McGowan

Assessing conservation priorities for forest Galliformes on Borneo

step is to determine which sites may be important for galliform conservation and to assess the level of conservation activity at each. On this basis, the relative merits of each site can then be considered and some priorities established. Appropriate conservation measures should be proposed, probably to take one of two forms. Where there is an existing conservation effort, it may be appropriate to promote more consideration of galliform species within the aims of each programme. Where there are no such programmes, the first step is likely to be to conduct baseline surveys.

As the distribution and habitat requirements of Borneo's birds are still poorly known, a list of priority sites will need compiling so that surveys can concentrate on collecting appropriate data from the most important sites. When this list has been drawn up, initiatives of surveys in key areas is required. Such surveys should be broad-based covering the whole spectrum of the forest avifauna but concentrating on Galliformes and other threatened species (*e.g.* raptors, hornbills and some pigeons). The tolerance to habitat degradation of the target species should be evaluated for all species. The areas which are potentially important for Bornean Galliformes include:

1. Tanjung Puting National Park (3,050 square kilometres). This swamp forest in Kalimantan has already been surveyed (Nash and Nash 1988). Black wood-partridge *Melanoperdix nigra*, and crested wood-partridge *Rollulus roulroul* have been reported and other Galliformes may be present.
2. Gunung Palung Nature Reserve (1,000 square kilometres). This West Kalimantan reserve contains swamp and hill forest that has been surveyed recently but the results are not yet published. The black wood-partridge is the only threatened galliform confirmed, but others may be present.
3. Gunung Betuang/Karimun (6,000 square kilometres). This hill forest in Kalimantan along the Sarawak/East Malaysia border has not been surveyed.
4. Bukit Raya/Bukit Baka reserves (6,900 square kilometres). These adjoining reserves contain about 2,000 square kilometres of hill and sub-montane forest in Kalimantan and Sarawak respectively which has been little explored (van Balen and Holmes 1993). The crimson-headed wood-partridge is likely to occur in this area. Rice (1989) has conducted a brief reconnaissance survey.
5. Ulu Barito. This area has been partly surveyed by Wilkinson *et al.* (1991). It is not currently a protected area.
6. Kutai National Park (2,000 square kilometres). This area in the Kalimantan lowlands along the east coast, contains forest in varying stages of disturbance (van Balen and Holmes 1993) that has been severely damaged by fire. The area was surveyed by Pearson (1975).
7. Sungei Kayan-Mentarang Nature Reserve (16,000 square kilometres) and the Sembakung extension (5000 square kilometres). Reconnaissance surveys of this hill forest on the Kalimantan side of the border with Sarawak are underway (van Balen *in litt.*). The forest is expected to contain many Bornean montane endemics, and the Borneo hill-partridge *Arborophila hyperythra* has already been reported from this area (van Balen and Holmes *in litt.*).
8. Long Bangun. This site in Kalimantan contains both lowland and hill forest which is believed to have been heavily logged. Nothing else is known of the area.
9. Hutan Kapur/Sang Kulirang (2,000 square kilometres). This is a series of limestone karst blocks which has been proposed as a protected area in Kalimantan. The area could be important for Galliformes in the adjacent footslope forest.
10. Danum Valley Research Centre, Sabah. North Kalimantan and eastern Sabah may well contain the

Assessing conservation priorities for forest Galliformes on Borneo

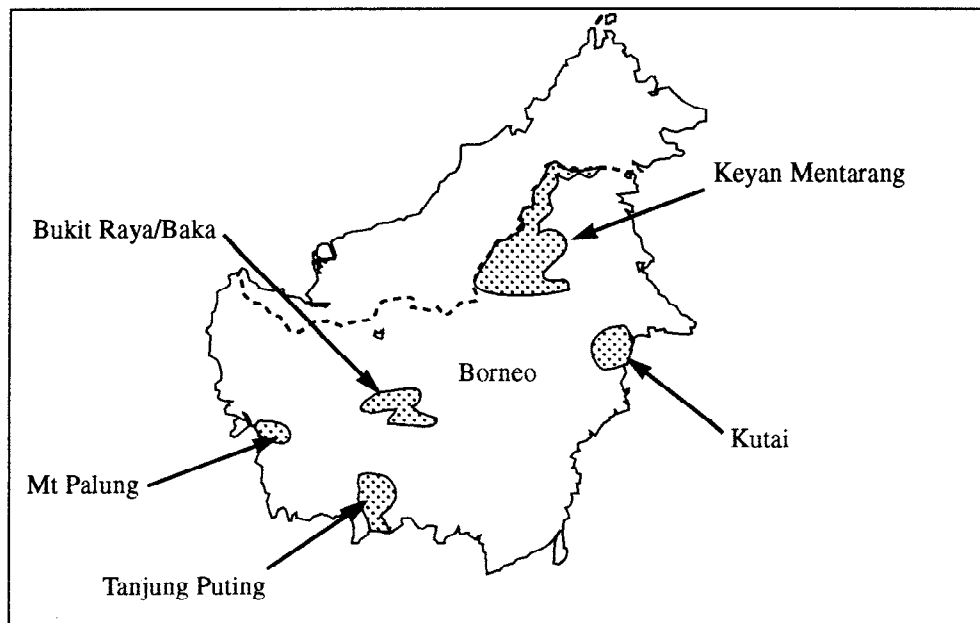
richest avifauna on Borneo. Both Danum Valley and the core of the Tabin Reserve in Sabah should be surveyed for Galliformes.

11. Sarawak. The importance of the forest along the border with Kalimantan for partridge conservation should be evaluated, as should other mountain areas, e.g. Batu Apoi National Park and Gunung Mulu National Park.

Time scale: Compilation of information on current work should be conducted during 1995 and assessed during early 1996 when priorities for field surveys can be drawn up. One or two such surveys can then be initiated between 1997-1999.

Suggested reading:

- van Balen, B. 1992. Distribution, status and conservation of the forest partridges in the Greater Sundas (Indonesia). In: Birkan, M., Potts, G.R., Aebischer, N.J. and Dowell, S.D. (eds.) *Perdix VI, First International Symposium on Partridges, Quails and Francolins. Gibier Faune Sauvage* 9:561-569.
- van Balen, S. and Holmes, D.A. 1993. Status and conservation of pheasants in the Greater and Lesser Sundas, Indonesia. In: Jenkins, D. (ed.) *Pheasants in Asia 1992* pp 40-49.
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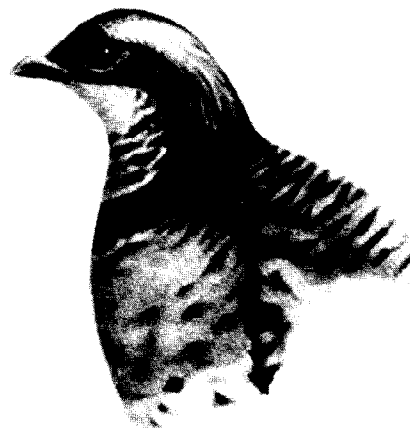
Some protected areas on Borneo

Survey of the re-discovered orange-necked hill-partridge *Arborophila davidi* in Vietnam

Mace-Lande status: Endangered

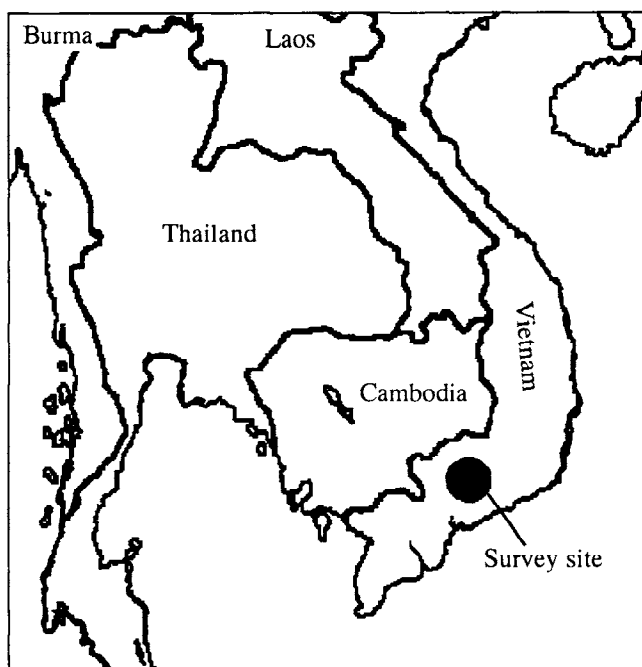
Aim: The conservation of a viable population of the orange-necked hill-partridge by locating extant populations and formulating a management plan.

Justification: This species is endemic to south Vietnam where it was only known from specimens collected at Bu Kroai [Bu Croi], Song Be Province (Cochinchina/S.Annam) in 1927 (Delacour *et al.* 1927). The type specimen was collected at about 250 m in densely wooded country with rolling hills (Delacour *et al.* 1927). No further records of the species were made (Collar and Andrew 1988) until it was rediscovered in June 1991 during the Vietnam Forest Surveys undertaken by BirdLife International and the Vietnam Forest Bird Working Group of Hanoi University. Two birds



Orange-necked hill-partridge

Artist: Timothy Greenwood



were seen briefly on 21st and 22nd June 1991 and a single bird two days later near Dac Lua sub-station, Nam Bai Cat Tien National Park (Eames *et al.* 1992) at about 200 m in bamboo forest (Eames *et al.* 1992). Nam Bai Cat Tien was declared a National Park in 1978 and land-use issues are briefly mentioned in Robson *et al.* (1991) and Eames *et al.* (1992). The type locality is 37 kilometres north-west of the Nam Bai Cat Tien sightings.

The orange-necked hill-partridge is a Restricted Range Species, occurring in Endemic Bird Area D22 which is Cochinchina and is a Priority II Endemic Bird Area. This is the only information that exists on this species and more is urgently needed. Since virtually nothing is known of the species' ecology, the scale of the threats to its survival are unknown. Nonetheless, it seems likely that the species has suffered a range contraction due to loss of habitat.

Survey of the re-discovered orange-necked hill-partridge in Vietnam

Project description: The species does occur in Nam Bai Cat Tien National Park (350 square kilometres) (Eames *et al.* 1992) and habitat protection and management is needed at this site and any further sites that are found. An extensive survey of suitable habitat is needed to determine where the species still occurs. This survey should start in Cay Cat Tien, an area of unprotected secondary forest adjacent to Nam Bai Cat Tien National Park. Within the Park, suitable habitat is believed to be widespread in the north-east and west of Bao Chim, Bao Ca and Bao Sua (Eames *et al.* 1992).

Time scale: Two years

Budget: \$5,000 - \$10,000

Suggested reading:

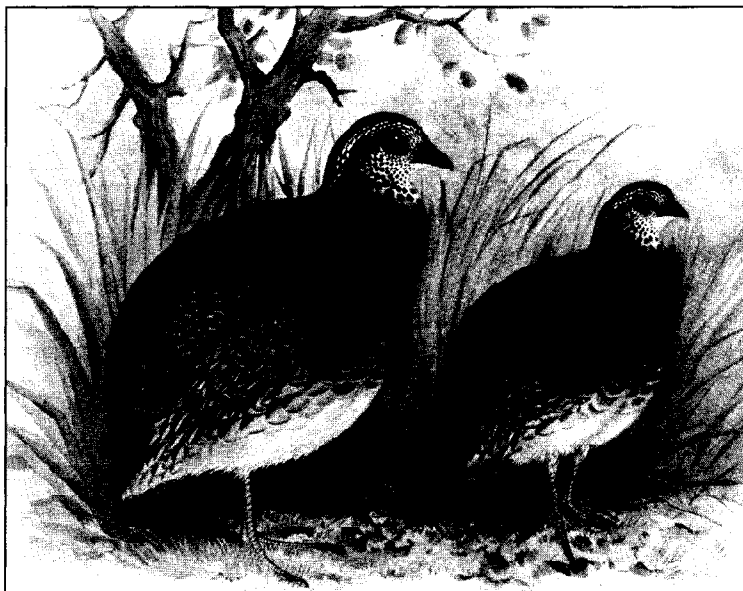
- Collar, N.J. and Andrew, P.A. 1988. *Birds to watch: the ICBP world checklist of threatened birds*. International Council for Bird Preservation, Cambridge.
- Delacour, J., Jabouille, P. and Lowe, P.J. 1927. On the birds collected during the third expedition to French Indo-China. *Ibis* 12(4):23-51.
- Eames, J.C., Robson, C.R., Nguyen Cu and Truong Van La 1992. *Forest bird surveys in Vietnam*. I.C.B.P. Study Report No. 51. International Council for Bird Preservation, Cambridge.
- Robson, C.R., Eames, J.C., Newman, M., Nguyen Cu and Truong Van La 1991. *Vietnam forest project 1989/90: final report*. Unpublished report to International Council for Bird Preservation, Cambridge.

Conservation of the threatened Galliformes in the Annamese lowlands of Vietnam

Mace-Lande status: Annamese hill-partridge *Arborophila merlini*, endangered

Aim: The identification and development of protected areas containing threatened Galliformes in the Annamese Lowlands Endemic Bird Area of central Vietnam.

Justification: The Annamese Lowlands Endemic Bird Area contains the endangered Annamese hill-partridge, as well as six threatened pheasant species, including the possibly extinct Edwards's pheasant *Lophura edwardsi*. This region is therefore of global importance for galliform conservation. Recent surveys have revealed that the Annamese hill-partridge occurs in the Bach Ma National Park within this Endemic Bird Area. Further surveys are needed to establish its distribution within this area, and specifically whether it occurs around Ke Go Lake. This is an important area for



Scaly-breasted hill-partridge *Arborophila charltonii*

Artist: Henry Jones

The central Vietnamese sub-species are *A. c. merlini* and *A. c. vivida* (not illustrated).

lowland Galliformes but the Annamese hill-partridge has not been recorded there so far. It is considered among the ten most important sites for biodiversity conservation in Vietnam.

Project description: The project will seek to build upon the surveys conducted by the Forest Bird Working Group of Hanoi University and BirdLife International by initiating habitat protection measures in the Annamese lowlands. In particular the project will:

1. Evaluate sites for the establishment of protected areas within the Endemic Bird Area. Protected areas that are in existence, or are proposed, for which the conservation importance must be established include, Thanh Thuy (70 square kilometres) and Vu Quang, (160 square kilometres) in Nghe Tinh Province, and Dong Phong Nha in Binh Tri Thien Province (50 square kilometres). Other localities which may be suitable for the conservation of Galliformes include Cat Bin forest, near Ho Ke Go in Ha Tinh Province, which is already known to hold both imperial and Vietnamese pheasants, and areas in Thua Thien and Quang Tri Provinces.
2. Select the most appropriate site(s) for future conservation action, after surveys and discussions with provincial and national authorities. Proposals should then be made to delimit an area for conservation. A management plan for the area should be written, concentrating on promoting wise-use of forest resources and sympathetic agricultural practices

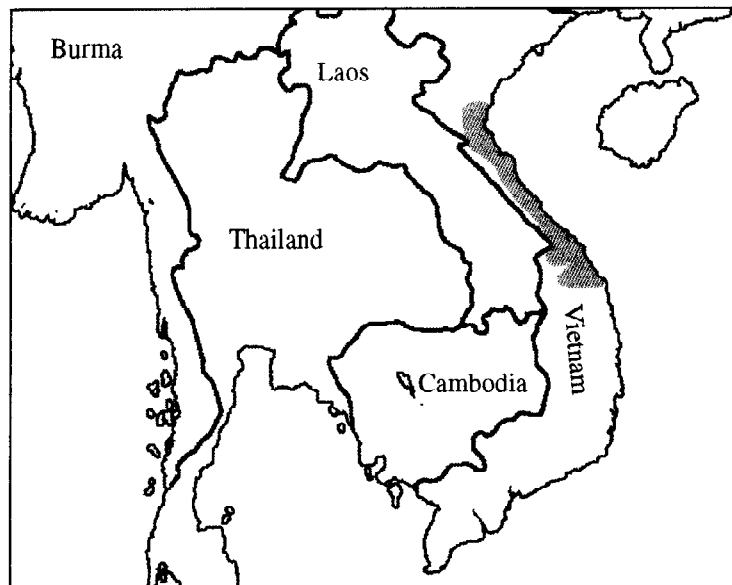
Conservation of the threatened Galliformes in the Annamese lowlands of Vietnam

Time scale: Two years.

Budget: \$120,000

Suggested reading:

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- Eames, J.C., Robson, C.R., Nguyen Cu and Truong Van La 1992. *Forest bird surveys in Vietnam*. I.C.B.P. Study Report No. 51. International Council for Bird Preservation, Cambridge.
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Summary of further project in South-east Asia

4.7.5. Conservation of threatened partridges in Thailand

Summary: Surveys of remaining primary forest are needed for the endangered Thai subspecies of chestnut-headed hill-partridge *Arborophila cambodiana diversa* and for the endangered Malay Peninsula subspecies of the scaly-breasted hill-partridge *A. charltonii charltonii*.

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