

The IUCN Species Survival Commission

Conservation and Development Interventions at the Wildlife/Livestock Interface

Implications for Wildlife, Livestock and Human Health



Conservation and Development Interventions at the Wildlife/Livestock Interface

Implications for Wildlife, Livestock and Human Health

Edited and compiled by Steven A. Osofsky

Associate Editors: Sarah Cleaveland, William B. Karesh, Michael D. Kock,
Philip J. Nyhus, Lisa Starr and Angela Yang

**Proceedings of the Southern and East African Experts Panel on
Designing Successful Conservation and Development Interventions
at the Wildlife/Livestock Interface: Implications for Wildlife, Livestock
and Human Health, *AHEAD* (Animal *H*ealth for the *E*nvironment *A*nd *D*evelopment)
Forum, IUCN Vth World Parks Congress, Durban, South Africa,
14th and 15th September, 2003**

Occasional Paper of the IUCN Species Survival Commission No. 30

The designation of geographical entities in this book, and the presentation of the material, do not imply the expression of any opinion whatsoever on the part of IUCN concerning the legal status of any country, territory, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

This publication was made possible through the support of a wide range of individuals and institutions. The opinions expressed herein are those of the authors, and do not necessarily reflect the views of IUCN, the Wildlife Conservation Society or other sponsors of the *AHEAD* (*Animal Health for the Environment And Development*) forum.

Published by: IUCN, Gland, Switzerland and Cambridge, UK



Copyright: © 2005 International Union for Conservation of Nature and Natural Resources

Reproduction of this publication for educational or other non-commercial purposes is authorised without prior written permission from the copyright holder provided the source is fully acknowledged.

Reproduction of this publication for resale or other commercial purposes is prohibited without prior written permission of the copyright holder.

Citation: Osofsky, S.A., Cleaveland, S., Karesh, W.B., Kock, M.D., Nyhus, P.J., Starr, L. and Yang, A. (Eds). (2005). *Conservation and Development Interventions at the Wildlife/Livestock Interface: Implications for Wildlife, Livestock and Human Health*. IUCN, Gland, Switzerland and Cambridge, UK. xxxiii + 220pp.

ISBN: 2-8317-0864-8

Cover photo: *AHEAD*

Layout by: IUCN Publications Services Unit

Produced by: IUCN Publications Services Unit

Printed by: Thanet Press, Margate, UK

Available from: IUCN Publications Services Unit
219c Huntingdon Road, Cambridge CB3 0DL,
United Kingdom
Tel: +44 1223 277894, Fax: +44 1223 277175
E-mail: books@iucn.org
www.iucn.org/bookstore

A catalogue of IUCN publications is also available.

Contents

Acknowledgements	vii	The Impact of Disease on Endangered Carnivores	xxiv
Abbreviations and Acronyms	ix	<i>Craig Packer</i>	
Introduction		Veterinary Challenges Regarding the Utilization	
Looking <i>AHEAD</i> While Looking Back	xiii	of the Kafue Lechwe (<i>Kobus leche kafuensis</i>)	
<i>Steve Osofsky</i>		in Zambia	xxv
World Parks Congress <i>AHEAD</i> Agenda	xv	<i>Victor M. Siamudaala, J.B. Muma,</i>	
Abstracts	xix	<i>H.M. Munang'andu and M. Mulumba</i>	
What is this Infamous “Wildlife/Livestock		The Health Paradigm and Disease Control:	
Interface?” A Review of Current Knowledge . . .	xix	Consideration of the Health of Ecosystems	
<i>Richard Kock</i>		and Impacts on Human Health and Rural	
Transfrontier Conservation Area Initiatives in		Livelihoods	xxv
Sub-Saharan Africa: Some Animal Health		<i>Michael D. Kock</i>	
Challenges	xix	Conservancies: Integrating Wildlife Land-Use	
<i>Roy G. Bengis</i>		Options into the Livelihood, Development	
Diseases of Importance at the Wildlife/Livestock		and Conservation Strategies of Namibian	
Interface in Kenya	xx	Communities	xxv
<i>Elizabeth Wambwa</i>		<i>Chris Weaver</i>	
Relevance of the ROSELT/OSS Programme in		“Counting Sheep”: The Comparative Advantages	
Maintaining the Ecological Integrity of Protected		of Wildlife and Livestock – A Community	
Areas and Surrounding Lands	xx	Perspective	xxvi
<i>Jesse Njoka</i>		<i>Michael J. Murphree</i>	
The Influence of Veterinary Control Fences on Certain		Foot and Mouth Disease Management and Land-Use	
Wild Large Mammal Species in the Caprivi Strip,		Implications in the Zimbabwean Lowveld: the	
Namibia	xxi	Rationale for Creating a Biosphere Reserve.	xxvi
<i>Rowan B. Martin</i>		<i>Raoul du Toit</i>	
Wildlife, Livestock and Food Security in the South		Protected Areas, Human Livelihoods and Healthy	
East Lowveld of Zimbabwe.	xxii	Animals: Ideas for Improvements in Conservation	
<i>David H.M. Cumming</i>		and Development Interventions.	xxvii
Tuberculosis – What Makes it an Ideal Disease for		<i>Gladys Kalema-Zikusoka</i>	
the Interface?	xxii	Impact and Value of Wildlife in Pastoral Livestock	
<i>Anita L. Michel</i>		Production Systems in Kenya	xxvii
Bovine Tuberculosis in the African Buffalo:		<i>Fumi Mizutani and Elizabeth Muthiani</i>	
The Role of Population Models	xxiii	A Regional/Community Approach to Conservation	
<i>Wayne M. Getz, Paul C. Cross, Anna E. Jolles,</i>		and Development Interventions at the Livestock/	
<i>James O. Lloyd-Smith, Sadie J. Ryan,</i>		Wildlife Interface	xxviii
<i>Peter W.J. Baxter, Justine Bowers, Craig T. Hay,</i>		<i>George Gitau</i>	
<i>Christiane Knechtel, Craig J. Tambling,</i>		Complementarity Between Community-Based Animal	
<i>Wendy C. Turner and J.T. du Toit</i>		Health Delivery Systems and Community-Based	
Experiences and Challenges of Wildlife Health		Wildlife Management? An Analysis of Experiences	
Management in the National Parks of Tanzania	xxiii	Linking Animal Health to Conflict Management in	
<i>Titus Mlengeya and Vitalis Lyaruu</i>		Pastoralist Areas of the Horn of Africa	xxviii
Control Options for Human Sleeping Sickness in		<i>Tim Leyland and Richard Grahn</i>	
Relation to the Animal Reservoir of Disease . . .	xxiii	Introduction of Foot and Mouth Disease-Infected	
<i>Susan C. Welburn, K. Picozzi, J. Fyfe, E. Fèvre,</i>		Buffalo into the Save Valley Conservancy in	
<i>M. Odiit, M.C. Eisler and P.G. Coleman</i>		Zimbabwe: Success or Failure?	xxix
Rinderpest Surveillance in Uganda National Parks	xxiv	<i>Chris Foggin and G. Connear</i>	
<i>Chris S. Rutebarika</i>		The Disease-Free Buffalo Breeding Project of the	
Virus Topotypes and the Role of Wildlife in Foot		State Veterinary Services and South African	
and Mouth Disease in Africa	xxiv	National Parks	xxix
<i>Wilna Vosloo, A.D.S. Bastos, M. Sahle, O. Sangare</i>		<i>Markus Hofmeyr</i>	
<i>and R.M. Dwarka</i>		Control of Domestic Dog Diseases in Protected	
		Area Management and the Conservation of	
		Endangered Carnivores	xxx
		<i>Karen Laurenson, Titus Mlengeya, Fekadu Shiferaw</i>	
		<i>and Sarah Cleaveland</i>	

Impacts of Wildlife Infections on Human and Livestock Health with Special Reference to Tanzania: Implications for Protected Area Management . . . xxx	
<i>Sarah Cleaveland, Karen Laurenson and Titus Mlengeya</i>	
Synergies Between Livestock Husbandry and Wildlife Conservation in Southern Province, Zambia . . . xxxi	
<i>Dale Lewis</i>	
Map of national parks and other major conservation areas of East and southern Africa xxxii	
<i>Sara Zeigler and Philip Nyhus</i>	
Full Papers	
1. What is this Infamous “Wildlife/Livestock Disease Interface?” A Review of Current Knowledge for the African Continent 1	
<i>R. A. Kock</i>	
2. Transfrontier Conservation Area Initiatives in Sub-Saharan Africa: Some Animal Health Challenges 15	
<i>Roy G. Bengis</i>	
3. Diseases of Importance at the Wildlife/Livestock Interface in Kenya 21	
<i>Elizabeth Wambwa</i>	
4. The Influence of Veterinary Control Fences on Certain Wild Large Mammal Species in the Caprivi, Namibia 27	
<i>Rowan B. Martin</i>	
5. Wildlife, Livestock and Food Security in the South East Lowveld of Zimbabwe 41	
<i>David H.M. Cumming</i>	
6. Tuberculosis – What Makes it a Significant Player at the Wildlife/Livestock/Human Interface? 47	
<i>Anita L. Michel</i>	
7. Experiences with and the Challenges of Wildlife Health Management in the National Parks of Tanzania 51	
<i>T. Mlengeya and V. Lyaruu</i>	
8. Control Options for Human Sleeping Sickness in Relation to the Animal Reservoir of Disease 55	
<i>S.C. Welburn, K. Picozzi, M. Kaare, E.M. Fèvre, P.G. Coleman and T. Mlengeya</i>	
9. Rinderpest Surveillance in Uganda National Parks 1998–2003 63	
<i>C.S. Rutebarika, N. Nantima, R.O. Ademun, J. Okori, G. Kalema and R. Kock</i>	
10. Virus Topotypes and the Role of Wildlife in Foot and Mouth Disease in Africa 67	
<i>W. Vosloo, A.D.S. Bastos, M. Sahle, O. Sangare and R.M. Dwarka</i>	
11. Disease Challenges Concerning the Utilization of the Kafue Lechwe (<i>Kobus leche kafuensis</i>) in Zambia 75	
<i>V. M. Siamudaala, J.B. Muma, H.M. Munang’andu and M. Mulumba</i>	
12. The Health Paradigm and Protected Areas: Linkages Between People and Their Livelihoods, Ecosystems and Natural Communities, Health and Disease . . . 81	
<i>Michael D. Kock</i>	
13. Conservancies: Integrating Wildlife Land-Use Options into the Livelihood, Development and Conservation Strategies of Namibian Communities 89	
<i>Larrye Chris Weaver and Patricia Skyer</i>	
14. “Counting Sheep”: The Comparative Advantages of Wildlife and Livestock – A Community Perspective. 105	
<i>Michael J. Murphree</i>	
15. Foot and Mouth Disease Management and Land-Use Implications in the Zimbabwean Lowveld: the Rationale for Creating a Biosphere Reserve 109	
<i>Raoul du Toit</i>	
16. Protected Areas, Human Livelihoods and Healthy Animals: Ideas for Improvements in Conservation and Development Interventions. 113	
<i>Gladys Kalema-Zikusoka</i>	
17. Impact and Value of Wildlife in Pastoral Livestock Production Systems in Kenya: Possibilities for Healthy Ecosystem Conservation and Livestock Development for the Poor 121	
<i>Fumi Mizutani, Elizabeth Muthiani, Patti Kristjanson and Helga Recke</i>	
18. Complementarity Between Community-Based Animal Health Delivery Systems and Community-Based Wildlife Management? An Analysis of Experiences Linking Animal Health to Conflict Management in Pastoralist Areas of the Horn of Africa 133	
<i>Richard Grahn and Tim Leyland</i>	
19. Approaches to Disease Control in Domestic Canids for the Conservation of Endangered Wild Carnivores 141	
<i>M. K. Laurenson, T. Mlengeya, F. Shiferaw and S. Cleaveland</i>	
20. Impacts of Wildlife Infections on Human and Livestock Health with Special Reference to Tanzania: Implications for Protected Area Management . . . 147	
<i>Sarah Cleaveland, Karen Laurenson and Titus Mlengeya</i>	
21. Synergies Between Animal Husbandry and Wildlife Conservation: Perspectives from Zambia 153	
<i>Dale Lewis</i>	
Appendices 157	
V th World Parks Congress: Emerging Issues – Official Document 159	
Original AHEAD Invitation 169	
AHEAD Working Group notes 175	
Biosketches of AHEAD Launch Invited Participants 205	

Acknowledgements

The launch of the Wildlife Conservation Society's *AHEAD* (*Animal Health for the Environment And Development*) initiative coincided with the Vth World Parks Congress held in Durban, South Africa in September 2003, and was carried out in partnership with The Wellcome Trust, the U.S. National Science Foundation (NSF), IUCN (including the Species Survival Commission's Veterinary Specialist Group and Southern Africa Sustainable Use Specialist Group), the African Union's Pan African Programme for the Control of Epizootics/Interafrican Bureau for Animal Resources, the Office International des Epizooties – the World Organisation for Animal Health (OIE), the World Wildlife Fund, the WWF Russell E. Train Education for Nature Program, as well as Pfizer Corporation and the U.S. Agency for International Development (USAID). We are extremely grateful for this breadth of support.

This volume is dedicated to all those invitees who made the time in their extremely busy schedules to actively participate in the “**Southern and East African Experts Panel on Designing Successful Conservation and Development Interventions at the Wildlife/Livestock Interface: Implications for Wildlife, Livestock and Human Health**” at the Vth World Parks Congress in September, 2003. The Wildlife Conservation Society (WCS) extends special thanks to all of those who **participated in (names in bold)**, supported, or helped with the organization of this special launch of WCS' *AHEAD* (*Animal Health for the Environment And Development*) Program: Susan Aiello, **Paul Bartels**, **Roy Bengis**, **David Brackett**, **Jan Broekhuis**, **Philippe Chardonnet**, **Sarah Cleaveland**, **Koos Coetzer**,

Pat Conrad, **Robert Cook**, **David Cumming**, Anick De Siebenthal, **Rod de Vletter**, **Holly Dublin**, Delwyn Dupuis, **Raoul du Toit**, **Mark Eisler**, **Susie Ellis**, **Jacques Flamand**, **Chris Foggin**, **Guy Freeland**, **Yolan Friedmann**, **Robert Fyumagwa**, **Julian Gee**, **Wayne Getz**, Mariano Gimenez-Dixon, **George Gitau**, Richard Grahn, Ginette Hemley, Liz Hillyer, **Markus Hofmeyr**, **Gladys Kalema-Zikusoka**, **William Karesh**, **Michael Kock**, **Richard Kock**, **Nick Kriek**, **Karen Laurenson**, **Dale Lewis**, **Tim Leyland**, Paula Luff, Libby Lyons, Martin Macphail, **Neo Mapitse**, **Laurie Marker**, **Rowan Martin**, Shaun Martin, Joe Matlhare, Jonna Mazet, Jeff McNeely, **Anita Michel**, Caroline Mitten, **Fumi Mizutani**, **Titus Mlengeya**, Sylvia Montero, Franklin Moore, **Pete Morkel**, Richard Mott, **Norman Mukarati**, **Gary Mullins**, **Mishek Mulumba**, **Simon Munthali**, **Marshall Murphree**, **Michael Murphree**, **Elizabeth Muthiani**, **Jacob Mwanzia**, George Nelson, **Laurel Neme**, **Jesse Njoka**, Mary Lee Norris, **Philip Nyhus**, **Steve Osofsky**, **Craig Packer**, Laurie Papineau, **Banie Penzhorn**, **Mary Phillips**, **Delphine Purves**, Christine Rastas, **Helga Recke**, Kent Redford, **Robin Reid**, **Chris Rutebarika**, **Innocent Rwego**, Andrea Santy, Sam Scheiner, Alejandro Schudel, Ryan Selby, Peter Shadie, Elaine Shaughnessy, **Victor Siamudaala**, Dewan Sibartie, Kokoe Sodji, **Bartolomeu Soto**, Lisa Starr, William Sugrue, Marie-Josée Talarico, **Piet Theron**, Alex Thiermann, Alfonso Torres, Joyce Turk, Miriam van Gool, Olivia van Melle Kamp, Bernard Vallat, Jean-Christophe Vié, **Wilna Vosloo**, **Kenneth Waithiru**, **Elizabeth Wambwa**, **Chris Weaver**, **Susan Welburn**, **Michael Woodford**, John Woodford, and



AHEAD invitees (or a good portion of them!) – Vth World Parks Congress – Durban, South Africa, September 2003

Angela Yang. Sincere apologies to anyone we may have inadvertently missed!

This forum and the resulting *Proceedings* would not have been possible without the support of The Wellcome Trust, the U.S. National Science Foundation (NSF), IUCN (including the Species Survival Commission’s Veterinary Specialist Group and Southern Africa Sustainable Use Specialist Group), the African Union’s Pan African Programme for the Control of Epizootics/Interafrican Bureau for Animal Resources, the Office International des Epizooties – the World Organisation for Animal Health (OIE), the World

Sincerely,

Steve Osofsky, DVM

Wildlife Conservation Society – Field Veterinary Program

Senior Policy Advisor, Wildlife Health

Wildlife Fund, the WWF Russell E. Train Education for Nature Program, as well as Pfizer Corporation and the U.S. Agency for International Development (USAID).

Finally, I extend warm thanks to Delphine Purves and Mary Phillips, formerly of The Wellcome Trust, for their support and participation, and of course to the Wildlife Conservation Society’s Field Veterinary Program for making this endeavor possible.

To Billy Karesh, Angela Yang, Robert Cook, Mike Kock, Richard Kock, Lisa Starr and Susie Ellis – thanks again for all of your time, creativity, and energy!

Abbreviations and Acronyms

AAAS	American Association for the Advancement of Science
ADMADE	Administrative Management Design for Game Management Areas
AE	adult equivalent
AGID	agar-gel immunodiffusion
<i>AHEAD</i>	Animal Health for the Environment And Development
AIDS	acquired immune deficiency syndrome
ASAL	arid and semi-arid lands
ASF	African swine fever
AU/CTTBD	African Union/Centre for Ticks and Tick-Borne Diseases
AU/IBAR	African Union/Interafrican Bureau for Animal Resources
AWF	African Wildlife Foundation
AZA	American Zoo and Aquarium Association
BIIT	blood infectivity incubation test
BINP	Bwindi Impenetrable National Park
BTB	bovine tuberculosis
CAHS	Community-based Animal Health Systems
CAHW	Community-based Animal Health Workers
CAMPFIRE	Communal Areas Management Program For Indigenous Resources
CAPE	Community-based Animal Health and Participatory Epidemiology
CBNRM	Community-Based Natural Resource Management
CBPP	contagious bovine pleuropneumonia
CCPP	contagious caprine pleuropneumonia
CI	Conservation International
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CITES	Convention on International Trade in Endangered Species
CONASA	Community-based Natural Resource Management and Sustainable Agriculture
CRB	Community Resource Board
DFID	Department For International Development
DNPWM	Department of National Parks and Wildlife Management
DRC	Democratic Republic of Congo
EAC	East African Community
ECF	East Coast fever (theileriasis)
EDD	Exotic Diseases Division
EIA	environmental impact assessment
EU	European Union
FAO	Food and Agriculture Organization (of the United Nations)
FEWS	Famine Early Warning System
FMD	foot and mouth disease
FVP	Field Veterinary Program
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GEF	Global Environment Facility
GIS	Geographic Information Systems

GLTFCA	Great Limpopo Transfrontier Conservation Area
GLTFP	Great Limpopo Transfrontier Park
GMA	Game Management Area
GR	Game Reserve
GREP	Global Rinderpest Eradication Programme
GTZ	Gesellschaft für Technische Zusammenarbeit
ha	hectare
HIV	human immunodeficiency virus
HUP	Hluhluwe-Umfolozi Park
ILRI	International Livestock Research Institute
IRDNC	Integrated Rural Development and Nature Conservation
IUCN	World Conservation Union (International Union for Conservation of Nature and Natural Resources)
JMB	Joint Management Board
KARI	Kenya Agricultural Research Institute
KEMRI	Kenya Medical Research Institute
KNP	Kruger National Park
KWS	Kenya Wildlife Service
LIFE	Living In a Finite Environment
LPEC	Livestock Production Efficiency Calculator
LSU	large stock unit
MAWRD	Ministry of Agriculture, Water, and Rural Development
MCF	malignant catarrhal fever
MET	Ministry of Environment and Tourism
MGE	mobile genetic elements
MOLD	Ministry of Livestock Development
NCAA	Ngorongoro Conservation Area Authority
NGO	nongovernmental organization
NIMR	Naval Institute of Medical Research (Tanzania)
NNF	Namibia Nature Foundation
NP	National Park
NSF	National Science Foundation
OAU	African Union (previously Organization of African Unity)
ODA	Overseas Development Administration
OIE	Office International des Epizooties, <i>also</i> World Organisation for Animal Health
OSS	Observatoire du Sahara et du Sahel
PACE	Pan African Programme for the Control of Epizootics
PARC	Pan African Rinderpest Campaign
PCR	polymerase chain reaction
PPR	peste des petits ruminants
RFLP	restriction fragment length polymorphism
ROSELT	Réseau d'Observatoires de Surveillance Ecologique à Long Terme
RP	rinderpest
RT-PCR	reverse transcription polymerase chain reaction
RVF	Rift Valley fever
SADC	Southern African Development Community
SANParks	South African National Parks

SARS	severe acute respiratory syndrome
SASUSG	Southern Africa Sustainable Use Specialist Group
SAT	South African Territories
SAVA	South African Veterinary Association
SEATIP	South East Africa Tourism Investment Program
SEL	South East Lowveld
<i>SRA</i>	serum-resistance associated (gene)
SSC	Species Survival Commission
SUA	Sokoine University of Agriculture
TANAPA	Tanzania National Parks
TAWIRI	Tanzania Wildlife Research Institute
TB	tuberculosis
TBD	tick-borne disease
TFCA	Transfrontier Conservation Area
TLU	tropical livestock unit
TPN3	Thematic Programme Network 3
TRAFFIC	Trade Records Analysis of Fauna and Flora In Commerce
TREP	Tropical Resource Ecology Programme
UAE	United Arab Emirates
UK	United Kingdom
UNCCD	United Nations Convention to Combat Desertification
UNEP-GEF	United Nations Environment Programme-Global Environment Facility
UNESCO	United Nations Educational, Scientific, and Cultural Organization
US	United States
US\$	United States dollars
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
UWA	Uganda Wildlife Authority
WCS	Wildlife Conservation Society
WHO	World Health Organization
WHS	Wildlife Health Sciences
WTO	World Trade Organization
WWF	World Wide Fund for Nature (World Wildlife Fund)
ZSL	Zoological Society of London