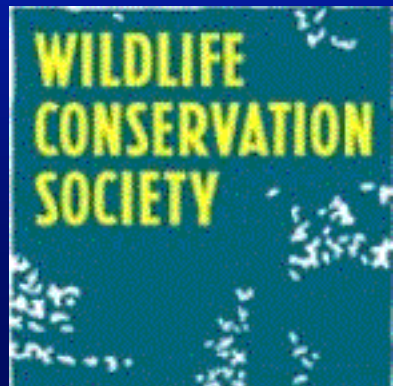
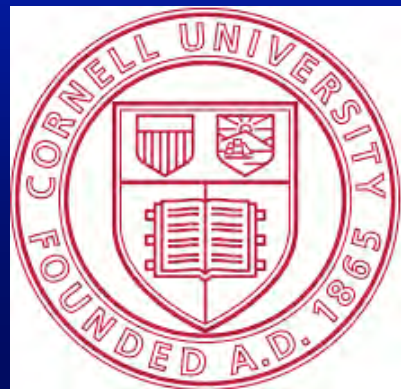


Diverse approaches to wildlife conservation: from animal stem cells to rural business development in Zambia (and how a Rotary Graduate Fellowship changed my life)

Alexander J. Travis VMD, PhD
August 8, 2007



Smithsonian
National Zoological Park



My history with Rotary

Haddonfield Memorial High School

- Interact club Vice-President
- RYLA participant
- Interact District Governor



Rotary Graduate Fellowship

- “co-sponsored” by Haddon Heights and Haddonfield, District 764 (now 7640)
- host club Croyden, District 981 (now 9810)
- studied wallaby reproduction with Roger Short and Marilyn Renfree



Two major approaches to conservation:

in situ conservation: protect habitats and ecosystems (individual species are usually secondary)

ex situ conservation: propagate species in captivity



Image Source: Hollingsworth, John and Karen, U.S. Fish and Wildlife Service



<http://www.savethetigerfund.org/>

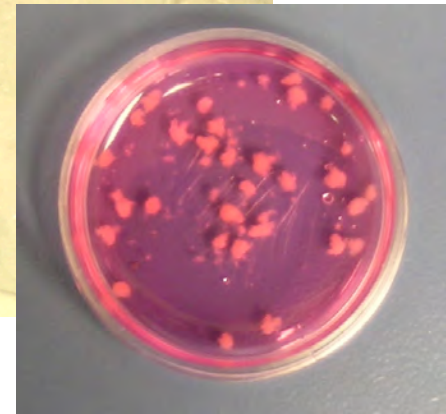
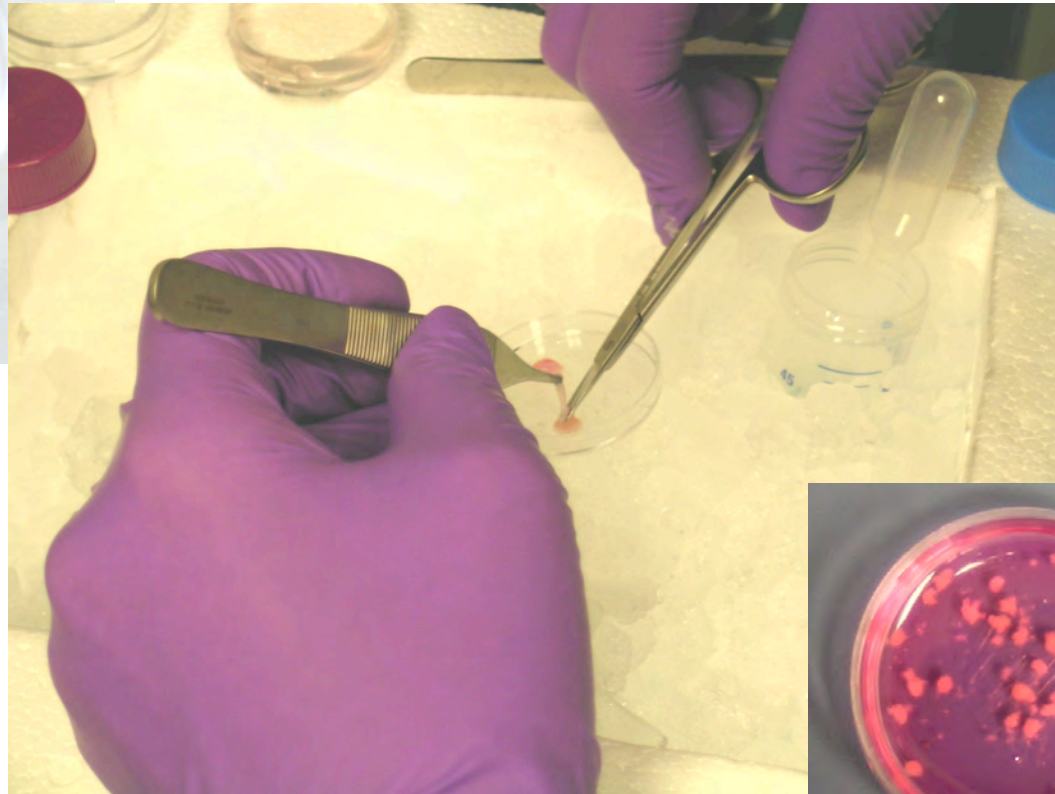
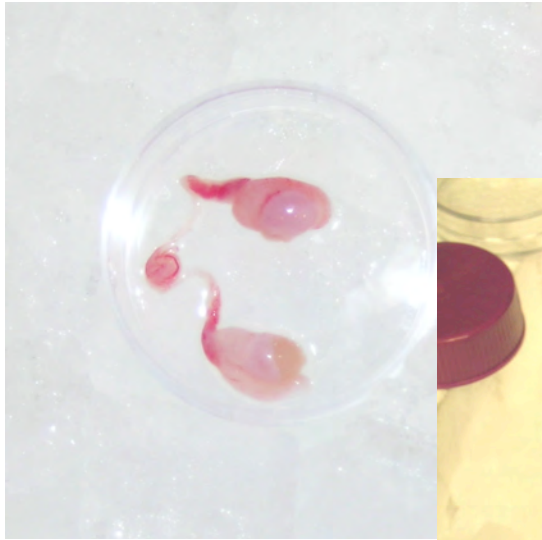


<http://www.sandiegozoo.org/animalbytes/images/>

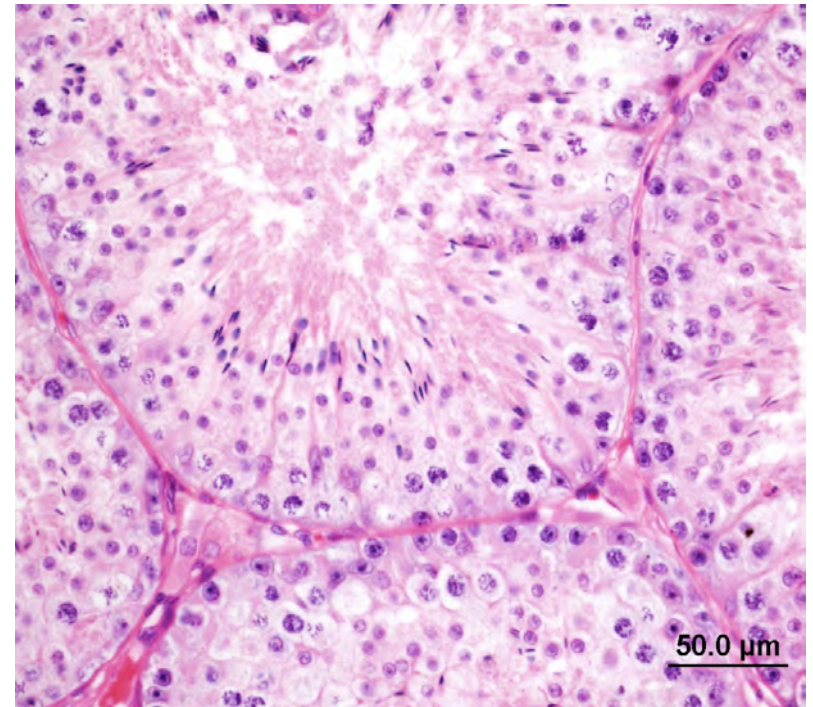
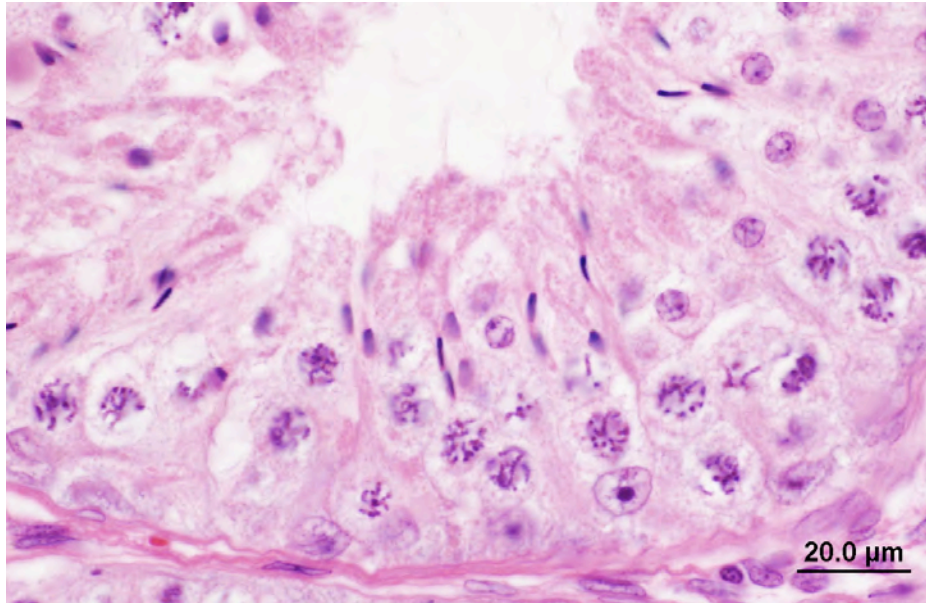
Advantages of techniques using SSC in conservation

1. *renewable* source of spermatozoa
2. can be harvested from *immature animals* that die before ever producing sperm

Testis xenografting



Sperm production in a ferret testis xenograft



Gourdon, Kim, and Travis, unpublished data

Other “Bench” Projects

- spermatogonial stem cell transplantation in cats and dogs
- semen collection, handling, and cryopreservation in Asian and African elephants



Acknowledgements

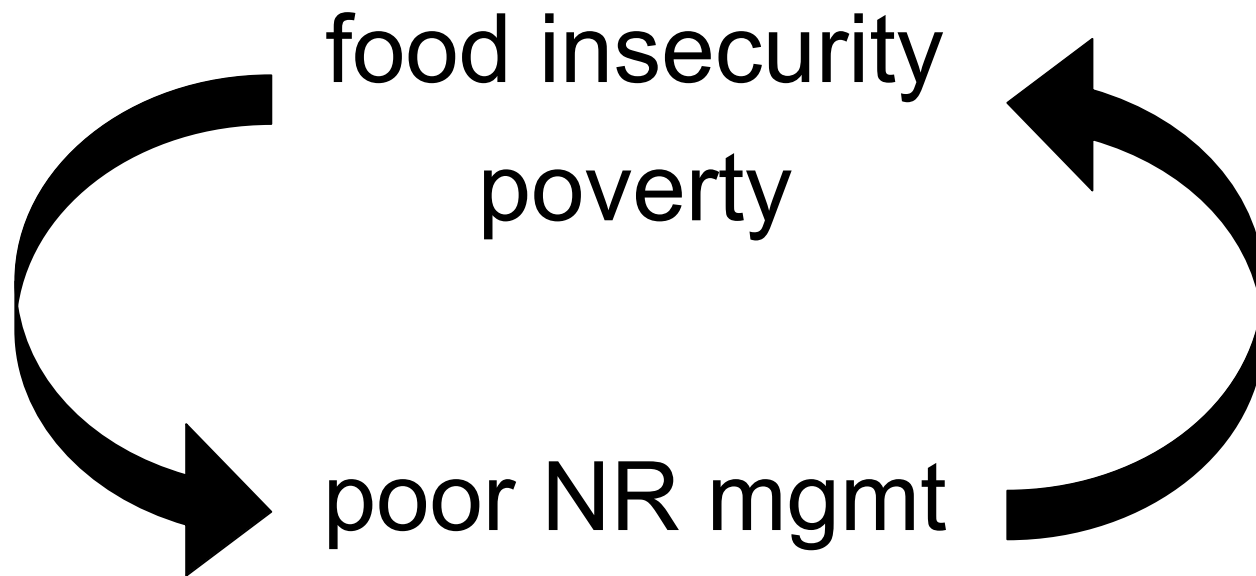
Baker Institute for Animal Health

- YeunHee Kim
- Vimal Selvaraj
- Jacquelyn Nelson

Conservation and Research Center, Smithsonian Institution

- Budhan Pukazhenth
- Pierre Comizzoli

Problems Affecting Conservation Are the Same Problems Affecting Rural Development



History of conservation strategies

- “fences and fines” approach
 - Disregard for historical land use patterns of people and animals
 - Failure to recognize need for sharing of resources
 - Over-reliance on law enforcement
 - Conservation viewed as working *against* the interest of local stakeholders
- community-based natural resource mgmt
 - False economic assumptions (expanding human needs cannot be met by NR & eco-tourism)
 - External “co-opting” by foreign concessions

Community Markets for Conservation



The COMACO Pilot Project

- site selection: Luangwa Valley, Zambia
- vital for wildlife-based tourism
- 20-60% of households are food insecure
- effects of cotton and tobacco
 - deforestation, pesticides, poverty cycle, HIV, gender inequality
- 42% of food insecure families poach
(annual loss of 3000-4000 animals in GMA in Valley alone)







The COMACO Pilot Project

- Use market incentives to make the adoption of sustainable agricultural and NRM practices economically and socially preferred.
- run for 5 years
- now covers 25,000 km²
- 30,000 families participate

How COMACO differs from other CB conservation plans

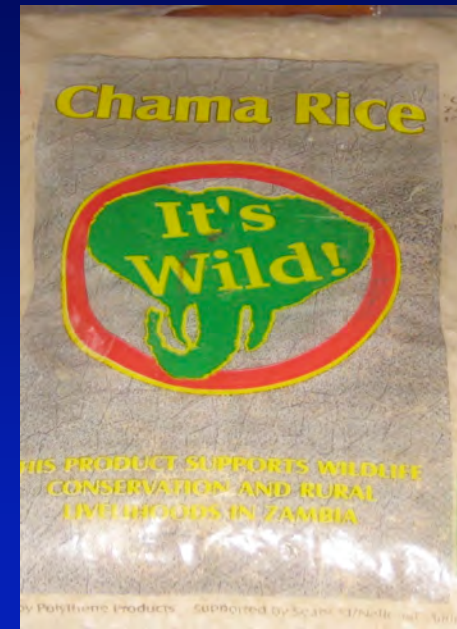
- primary target: improve food security and rural livelihoods
- participatory: community-owned, led, and staffed
- economic development based on sound economic principles (reducing transportation costs, improving market access, value-added products), NOT eco-tourism (which is being developed as a downstream “side-effect”)
- strives to be socially, environmentally, and economically sustainable

Implementation

- Choose first participants (food insecurity, likelihood to poach)
- Supplemental maize exchanged for guns/snares and successful training in conservation farming techniques
 - “pothole” farming, retention of crop residues (no burning), composting, crop rotation, agroforestry
- Families get to pick crops they wish to grow (critical because of soil, climate, culture and gender differences--HIV/AIDS 16.5%, many households with single, female parent)

over 40,000 wire snares and 800 illegal guns have been collected

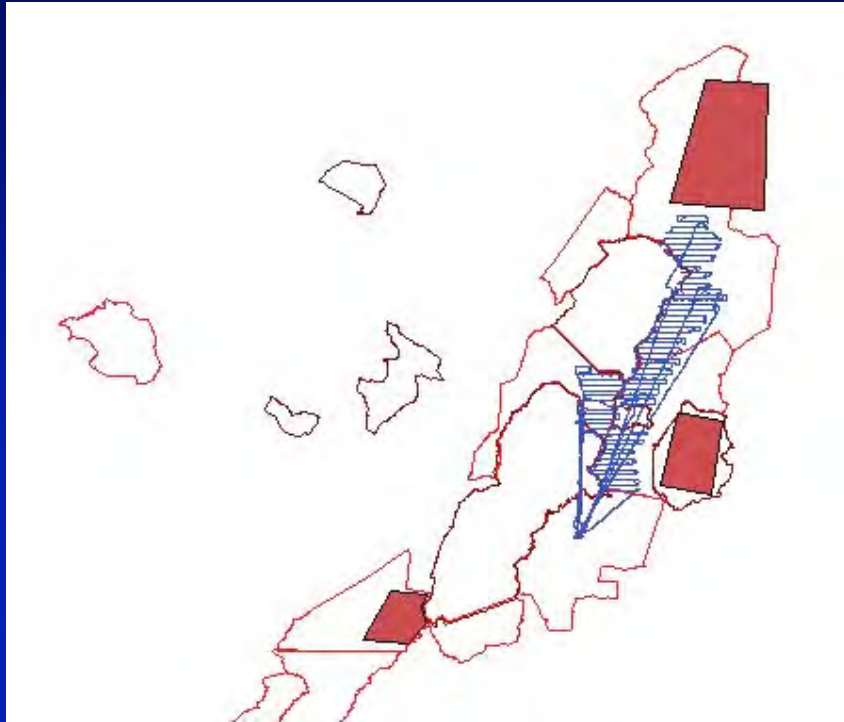




What is Cornell doing?

- economic analyses of the trading centers
- economic analysis of this approach to conservation--what would it take to replicate this model?
- food production--safety/hygiene training, product analysis, product development
- soils and crop sciences--what kinds of compost work best with the different soils?
- veterinary sciences--improve rural poultry production, interface of livestock/wildlife/human health
- social sciences--what are the effects on family nutrition, incomes, education?
- watershed analysis--how does deforestation on the plateau influence villagers and habitats in the Valley?

So what is a reproductive biologist doing in Zambia?



Area	COMACO Core	Upper control	Lukusuzi NP	Chisomo GMA
Area sampled (km2)	5329	5303	3758	250
Species				
Buffalo	156	0	0	0
Wildebeest	167	0	0	0
Waterbuck	75	0	0	0
Zebra	116	13	15	0
Elephant	207	24	0	32
Eland	7	0	0	0
Hartebeest	40	0	2	0
Roan	14	3	11	0
Kudu	13	1	1	0
Puku	224	0	0	0







Acknowledgements

Cornell University

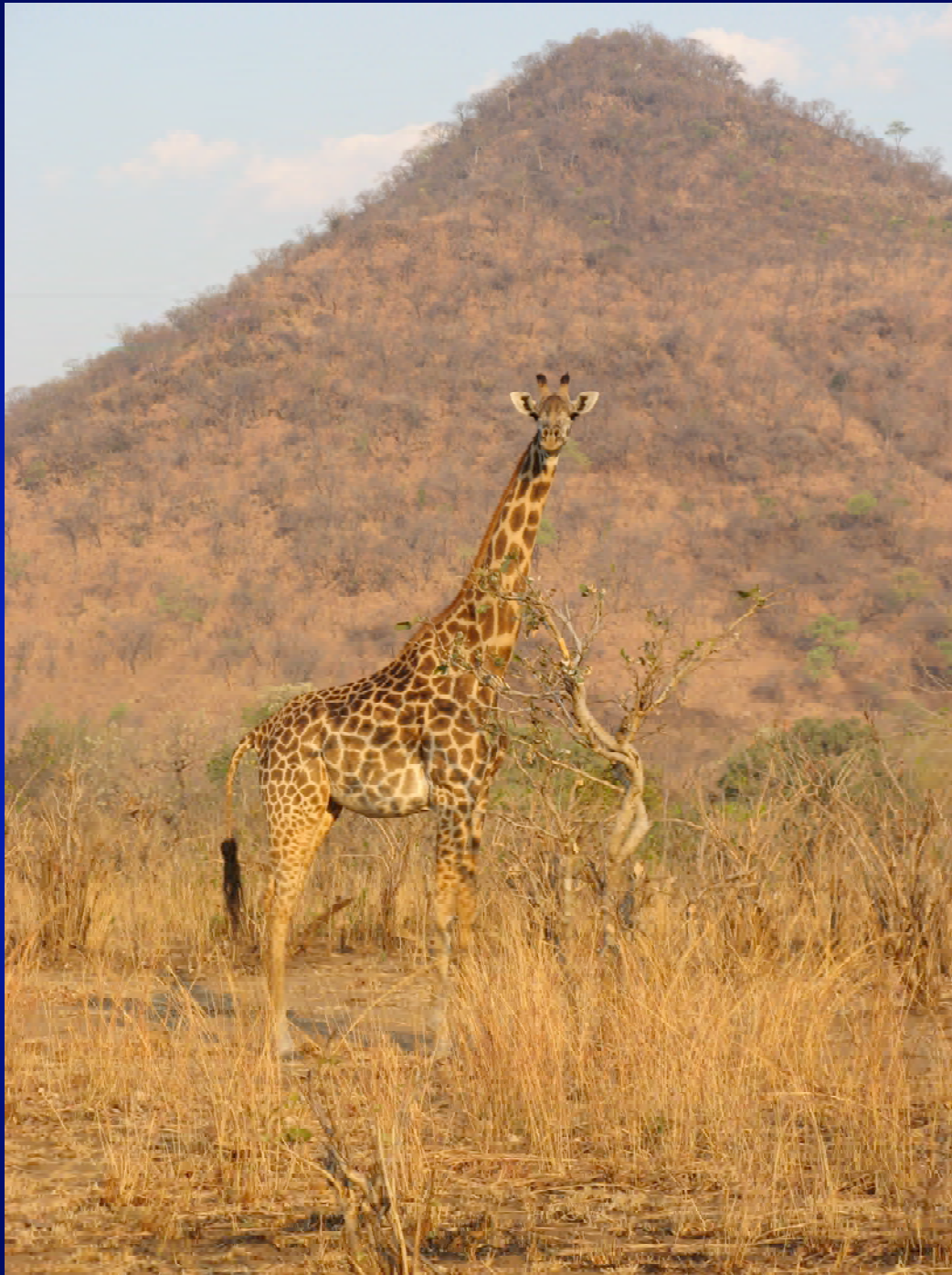
Alfonso Torres
Noha Abou-Madi
Beth Buckles
Duane Chapman
Jon Conrad
Parfait Eloundou-Enyegue
John Fay
Peter Hobbs
George Kollias
Johannes Lehmann
Benjamin Lucio
Carmen Moraru
Alice Pell

Wildlife Conservation Society

Dale Lewis
Steve Osofsky
David Moyer

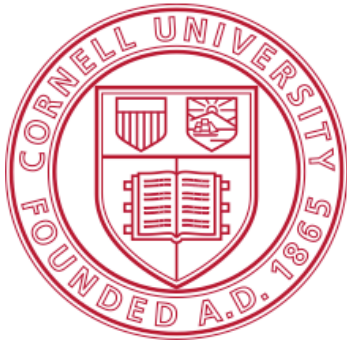
Virginia Tech University

Conrad Heatwole
Keith Moore
Theo Dillaha



THANK YOU!

ajt32@cornell.edu



COMACO



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