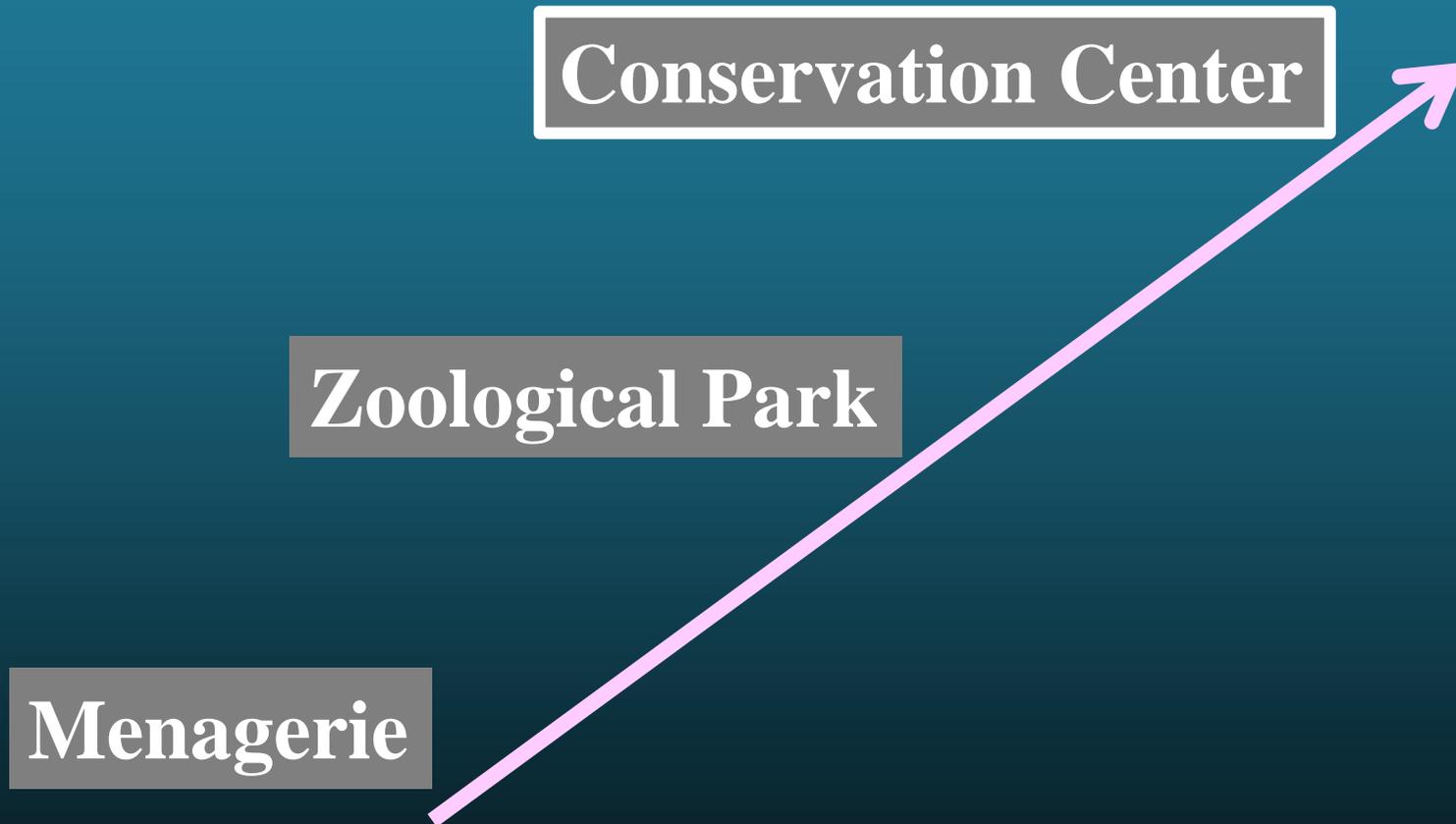


The Health of Wildlife: The Role and Needs of Zoological Conservation Organizations

Robert A. Cook



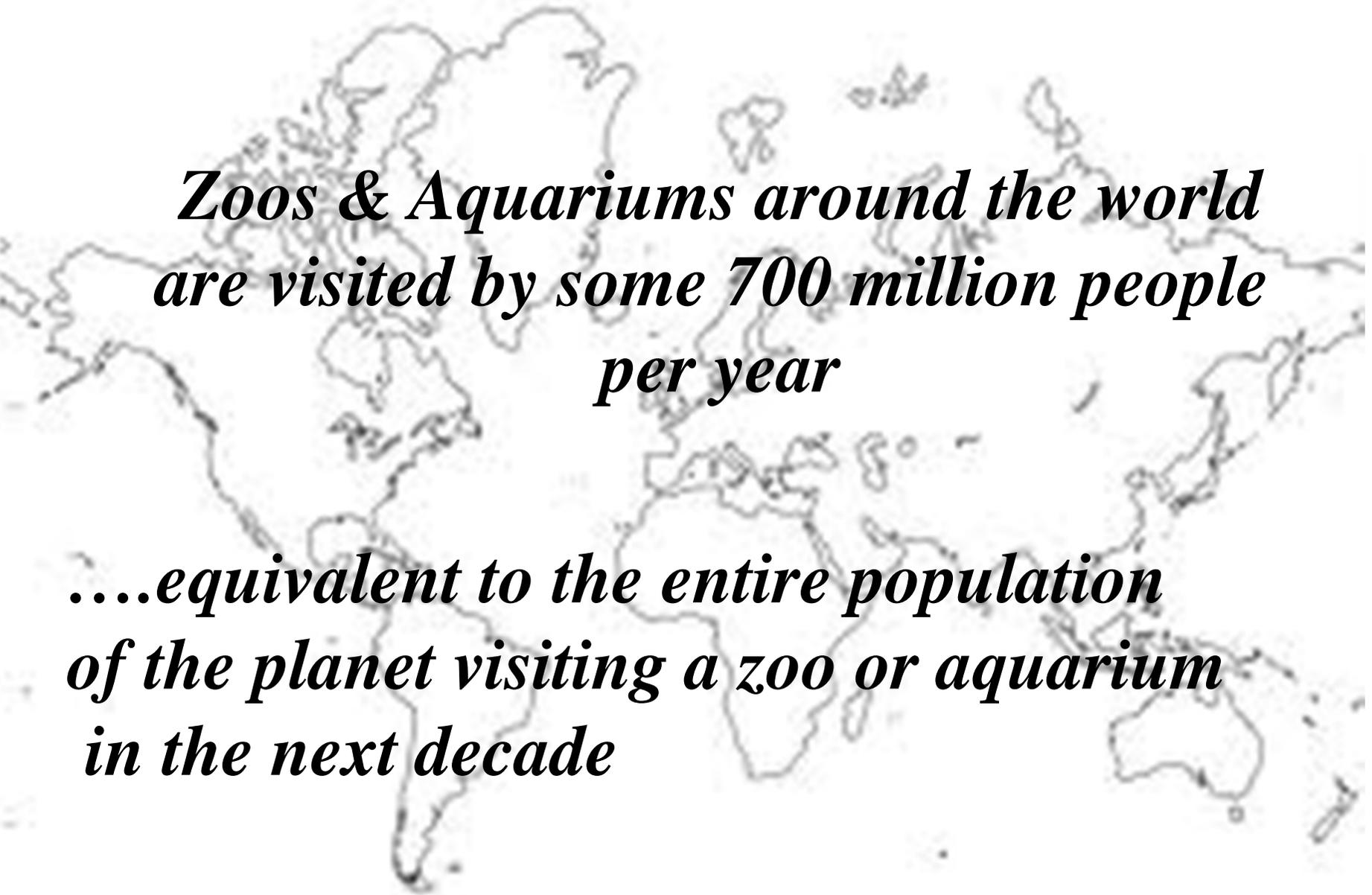
Evolution of Zoos & Aquariums



Adapted from World Zoo Conservation Strategy (IUDZG/CBSG 1993)



**Over 300 of the Worlds Leading
Zoological Institutions**
conservation, management, breeding & welfare



*Zoos & Aquariums around the world
are visited by some 700 million people
per year*

*....equivalent to the entire population
of the planet visiting a zoo or aquarium
in the next decade*

Regional Zoo & Aquarium Associations





*Of the 2400 USDA licensed animal exhibitors
in the USA only ~200 (<10%)
meet the AZA accreditation
standards for membership*



Species Survival Plans

*Maintain demographically sustainable populations for at least
100 years with genetic diversity exceeding 90%*



Accreditation Standards

- Animal Collection
- Conservation
- Education
- Research
- Governance
- Staff
- Veterinary Care



EAZA

**Minimum Standards for the
Accommodation and Care of
Animals in Zoos and
Aquaria**



Accreditation Standards

- Animal Collection
- Conservation
- Education
- Research
- Governance
- Staff
- Veterinary Care

Guidelines for Zoo & Aquarium Veterinary Medical Programs & Veterinary Hospitals

AAZV 2009



AMERICAN
ASSOCIATION
OF ZOO
VETERINARIANS

- Meets or exceeds U.S. Animal Welfare Act, Title 9, Part 2.40
- 24hr x 7d Veterinary care available
- Protocols for use of animal medications comply with U.S. FDA regulations
- Written program of preventive medicine
- Necropsy and proper disposal of deceased animals- in accordance with local & federal laws
- Nutrition program
- Quarantine of all newly arrived animals
- Isolation of sick animals
- Guidelines for hospital facilities
- Record keeping & animal identification

Animal Identification Systems & Record Keeping

Animal Identification has been one of the foundations of quality zoological health care and medical record keeping for the last 25 years or more. Redundant systems of identification can include RFIDs, tattoos, pattern recognition, banding, ear tag and more. Every mammal has at least 2 methods of identification and frequently three. So hoofstock may get ear tagged, tattoo'd, ear notched and RFID transpondered.

This corresponds to a 25 year program in Electronic Animal Medical Record Keeping. An independent 501C3, the International Species Information System provides software that allows for the maintenance of individual animals at zoological parks as well as the ability to pool physiological data to determine normal values for thousands of species. This past year the first phase of a new web based program, Zoological Information Management System went through initial startup. The veterinary module is due to be completed in late 2011 or early 2012.

Established as the
New York Zoological
Society in 1895



Photo: R.A. Cook



Beyond Exhibition & Education

To

Direct Conservation Impact

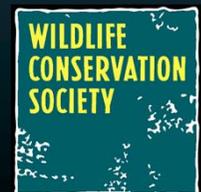
Field Conservation Programs

- **Dedicated to saving wildlife and wild places worldwide**
- **Over 500 projects in 62 nations**
- **Managing over 70 landscapes globally**



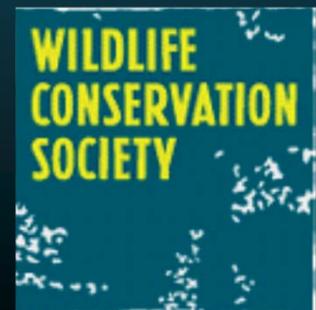
Photo: R.A. Cook

**WCS helps protect over 200M acres of land
around the world- 25% of global biodiversity**



Maintaining Species Biodiversity

Photo: R.A. Cook



5 Parks in the City of New York
1,300+ Species
Over 4 million guests



**Bronx
Zoo**

**Central Park
Zoo**



**Queens
Zoo**

**Prospect Park
Zoo**



**New York
Aquarium**

Connect People To Wildlife

a call to conservation action



Photo: R.A. Cook 1999

*Ensure the health & well-being of the
wildlife we hold in trust*

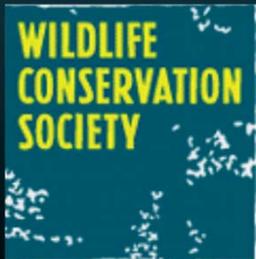
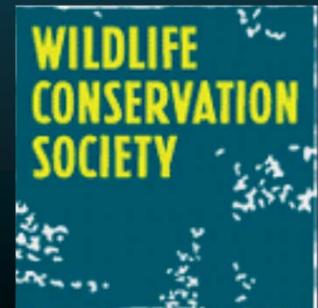


Photo: Julie Larsen Maher@WCS

Propagation

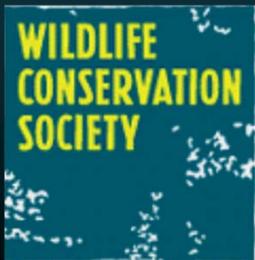
- Sustainable zoo populations
- Conservation assurance populations
- Reintroduction



Informal Science Education

Teaching Kids, Teachers & Guests

- **150,000 school children instructed in NYC**
- **Train 1200 teachers annually**
- **Masters in Science Education**
- **400 volunteers at 5 parks**



Global Health Programs

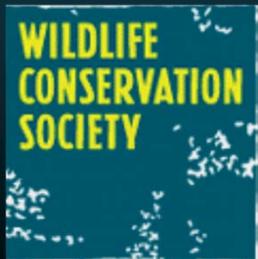


Photo: D. DeMello

5 Parks in the City of New York

1300+ species

24x7



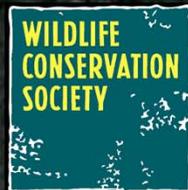
**Bronx
Zoo**

**Central Park
Zoo**



**Queens
Zoo**

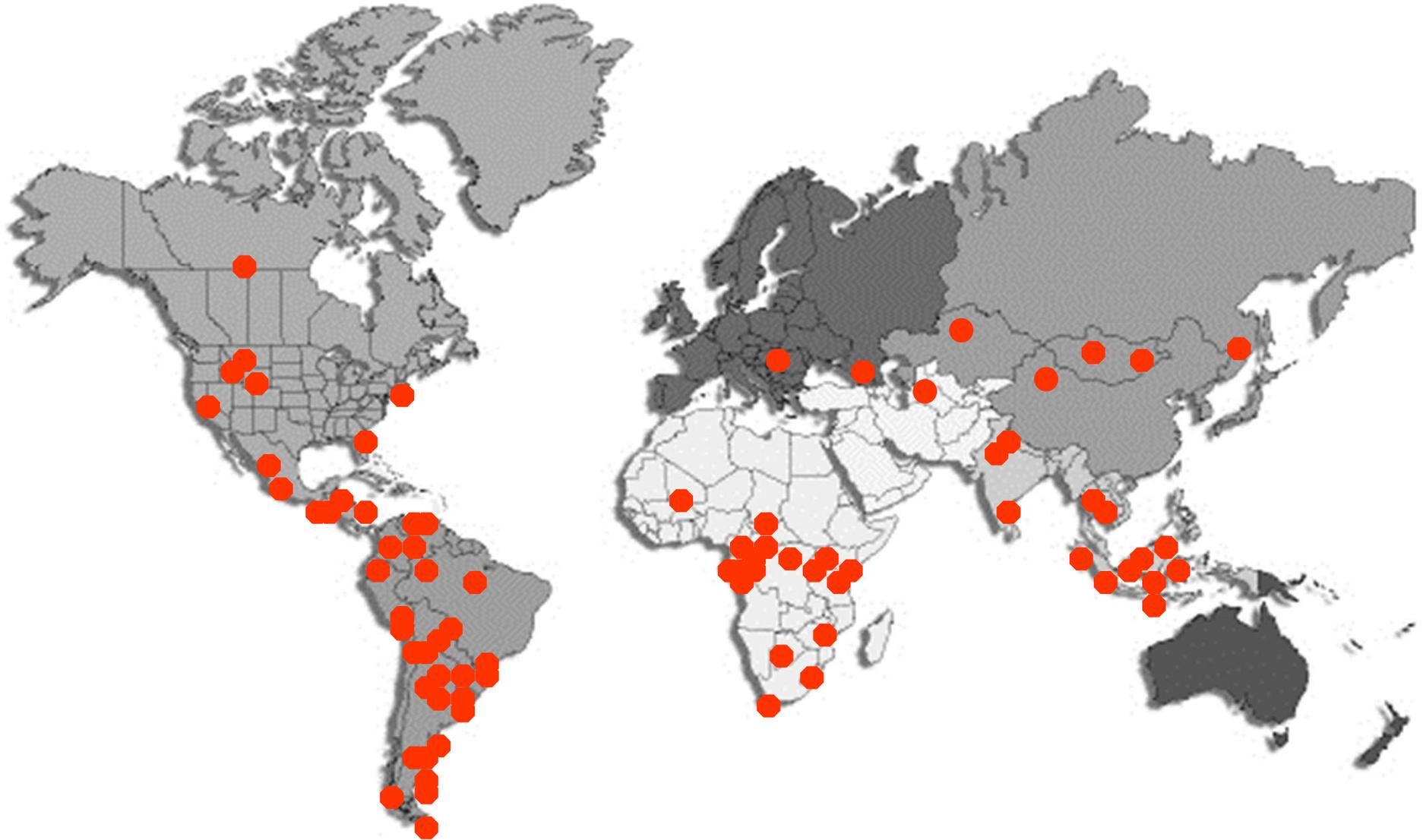
**Prospect Park
Zoo**

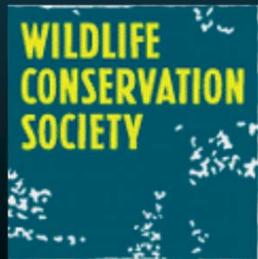


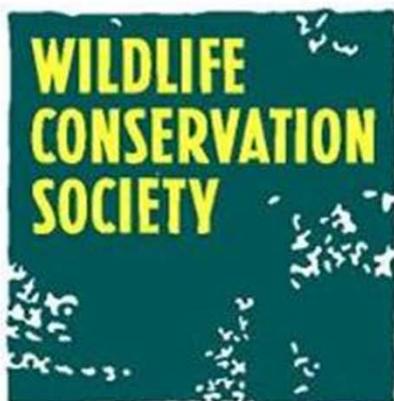
**New York
Aquarium**



The Health of Wildlife Populations Worldwide





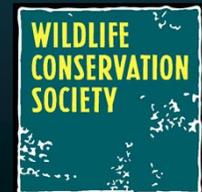


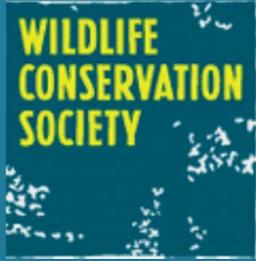
one world • one health[®]

Zoological Health Programs

Clinical Care

Our veterinary care specialists provide coverage 7 days a week and with veterinary residents living on-site at our Wildlife Health Center we are on-call for our collections every night. The veterinary residency program is one of the few in a large zoo with a diversity of wild animals and is a critical learning experience for the next generation of leadership.

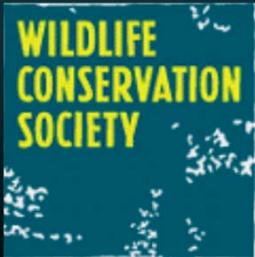




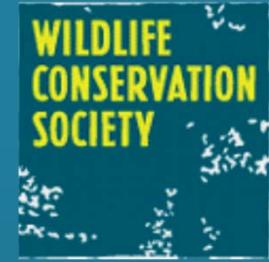
- Medicine & Surgery
- Preventive Health
- Diagnostic Testing
- Reproductive evaluations
- Dental Care
- Imaging

Photo: R. Cook

Applying Technologies In Novel Ways



Vaccinology



African Wild Dogs

Vaccinology is another area of innovation- Wild Dogs in Africa are susceptible to rabies and distemper virus contracted from feral dogs which has caused local extinctions throughout their historic range. WCS works with Wild Dogs both in our parks and with free-ranging populations in Africa. Using the more controlled setting with our Bronx Zoo group allowed the veterinary team to assess the efficacy of rabies vaccines prior to implementing programs in the wild.

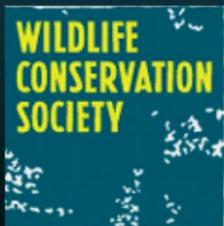
Reintroduction & Translocation

Kihansi Spray Toad

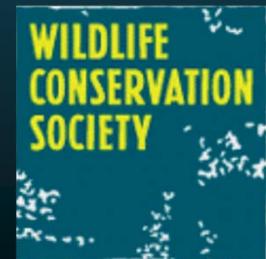
Our curatorial and health staff working with our partners at the Toledo Zoo and the Government of Tanzania have undertaken an effort to save the kihansi spray toad, now extinct in the wild following the completion of the kihansi gorge dam project. Over 10 years our husbandry and health staff successfully bred and managed the species in captivity while training colleagues in Tanzania and advising on the design and construction of a propagation facility in Dar Es Salaam. I am pleased to report that 6 months ago we returned the first toads to Tanzania and that breeding colonies are now being maintained at the Tanzanian propagation facility. We hope that within the next year we will be able to report that Kihansi Spray Toads have been repatriated to the wild into safe areas.

Animal Movement

Successful propagation results in animal movement to maintain genetically diverse populations in zoological parks. The health group does pre-shipment examinations and diagnostic testing which assure that animals will not carry diseases to naive populations. We also do testing in order to comply with government regulations. As well when animals arrive at our parks they are placed in a minimum 30 day quarantine where they are examined, tested and observed to ensure that no new disease organisms are introduced into the closed park populations.

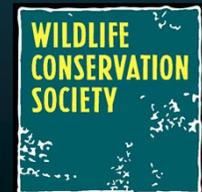


And what we learn through our health program in our zoological parks can have application to field health efforts as well as field health experiences provide valuable insight into caring for individuals in ZOOS.



Wildlife Pathology

We have a staff of boarded veterinary pathologists who examine animals when they die and add to the body of information which is the foundation of our medical programs



West Nile Virus- 1999

Any unusual deaths in free-ranging wildlife are also examined in and around our parks. In 1999 Pathologists at WCS were the first to make the connection between wild crows dying and people dying of a new disease. They played a central role in the diagnosis of West Nile Virus. Making wildlife surveillance a standard procedure allows our pathologists to discover problems and provide other health professionals critical information as part of an early warning system for our region.

Emerging Disease Surveillance



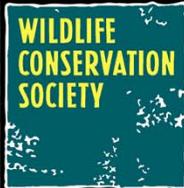
**Bronx
Zoo**

**Central Park
Zoo**



**Queens
Zoo**

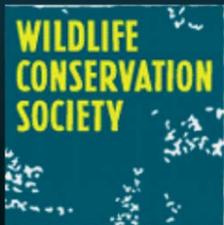
**Prospect Park
Zoo**



**New York
Aquarium**

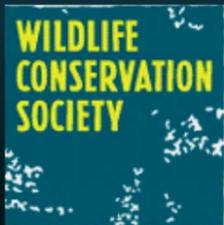
Molecular diagnostics

In recent years we have also added molecular diagnostic expertise to our staff and can now test species for a variety of known or emerging pathogens.

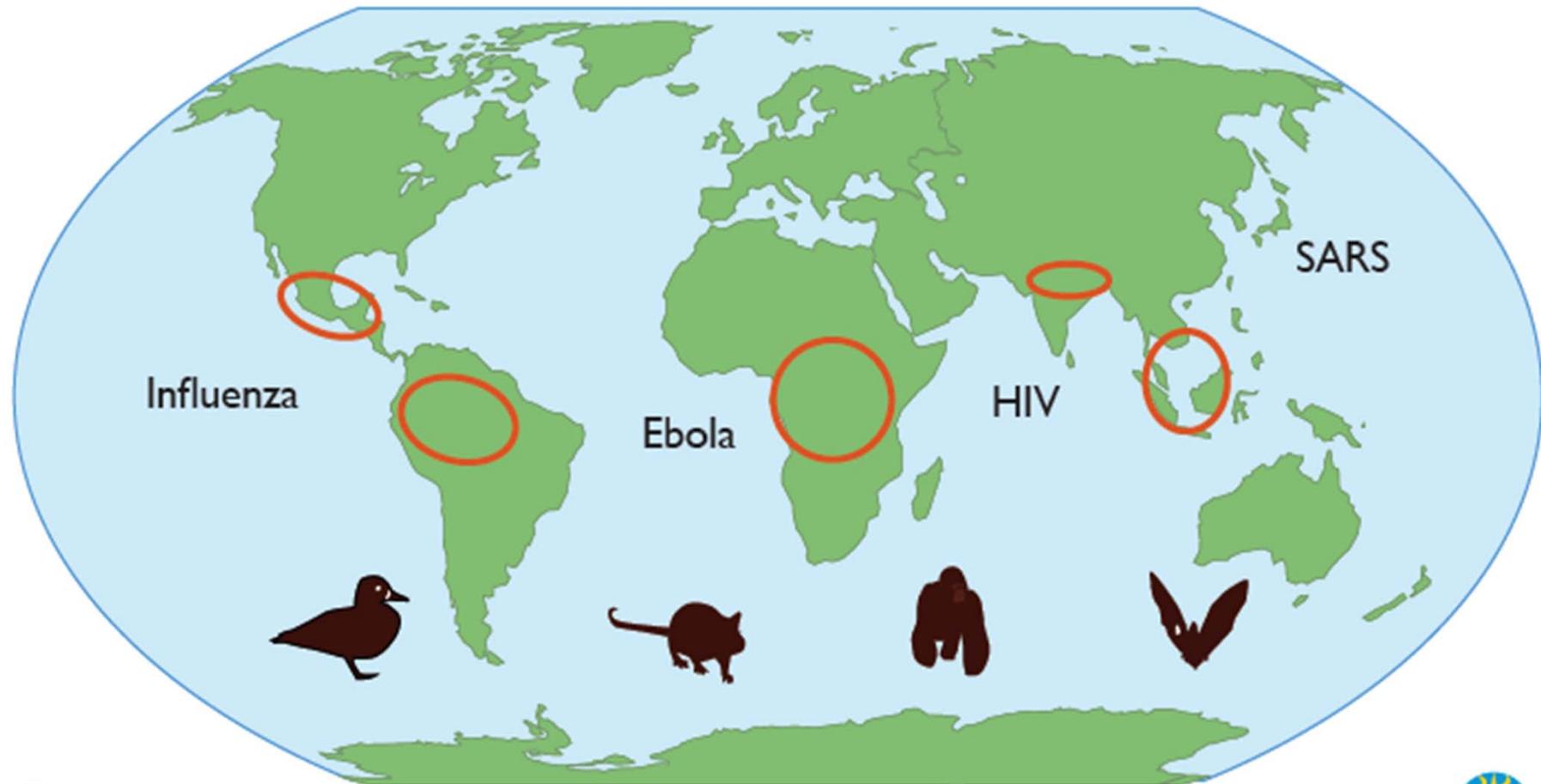


Field Health Programs

You have already heard from a number of the professions leading field wildlife health experts including WCS scientists Drs. Marcy Uhart, Alain Ondzie and Mark Atkinson, so I will not elaborate further on their programs



Emerging Pandemic Threats- PREDICT



Smithsonian Institution

Additional Partners: Columbia University, Harvard University (ProMED, HealthMap); Institute of Zoology, London; Principo International; Princeton University; University Of Edinburgh; Yale University

Illegal Wildlife Trade

And that as an organization we are very concerned about and involved in defining the disease and conservation threats posed by the illegal wildlife trade.

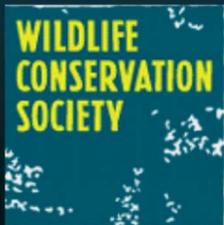


Photo: R.A. Cook

The Importance of Animal Movement & The Challenges of Regulations

I would like to emphasize further the importance of animal movement and the challenges posed by regulations on that movement. Regulations governing this movement are primarily written to protect domestic livestock and human health. However, what might be written to govern livestock or protect people can result in unintended negative impacts on wildlife. This can threaten the safe movement of endangered and threatened species.



Photo: R.A. Cook

Non-Human Primate Import into USA

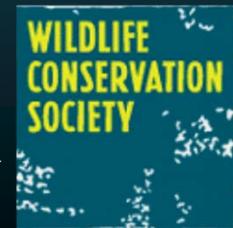
- 3 Negative tb tests
- 2 blood draws for ebola v.

Primates entering the US from any other country must undergo a quarantine period where 3 negative tb tests are performed 2 weeks apart and there are 2 blood draws for banking to test for ebola virus. This typically requires at least 3 immobilizations over a 5 week period. No considerations is given to point of origin – so an animal originating from the Paris Zoo, with a known medical history is treated the same way as one coming from the wilds of the Congo. In addition, certain species of primates, especially folivorous species tend to have erroneous responses to tuberculin skin tests.



Ruminant & Swine Entering US

Prior to entering the US, ruminants and swine to be imported would have to undergo a minimum 30-day quarantine in a USDA-approved pre-embarkation quarantine facility, where they'd be tested for taxa-specific diseases of concern to the USDA. In countries with rinderpest or foot and mouth disease, the quarantine is 60 days. Following receiving negative test results (and the appropriate quarantine), the animals could be moved to Newburgh for an additional 30-day quarantine before being released to the zoo. Thereafter animals remain in permanent post-entry quarantine within the facility. The animals may be immobilized 3 to 4 times in order to undergo the required testing and should there be a response to one of the required tests then the period of quarantine may be extended with further immobilizations required. The diagnostic tests were developed for domestic livestock and wildlife species may respond in a spurious manner.



In closing, it is important to learn more about the zoological parks within your region and to see them as a potential resource for wildlife disease expertise. We who work in the zoo and wildlife health profession are challenged to provide for the quality care of wild animals in zoological parks and in wildlife parks. As species are under threat of extinction and we work to preserve biodiversity we will increasingly be called upon to move animals around the globe to save them. Often times the regulations written to protect livestock and human health are not promulgated to also ensure the health and well-being of wildlife. If we are to preserve a future for species biodiversity and by extension, the health of ecosystems and ultimately humanity- we must work together to create better diagnostic tests and better regulations.



Photo: Julie Larsen Maher@WCS