Conservation Detection Dogs and Possible Applications to Disease Management

Interagency Bison Management Plan Meeting, Chico, 21 Nov, 2013

Pete Coppolillo, Ph.D.
Executive Director
Working Dogs for Conservation
Pete@WorkingDogsForConservation.org
+1 406 290 9453

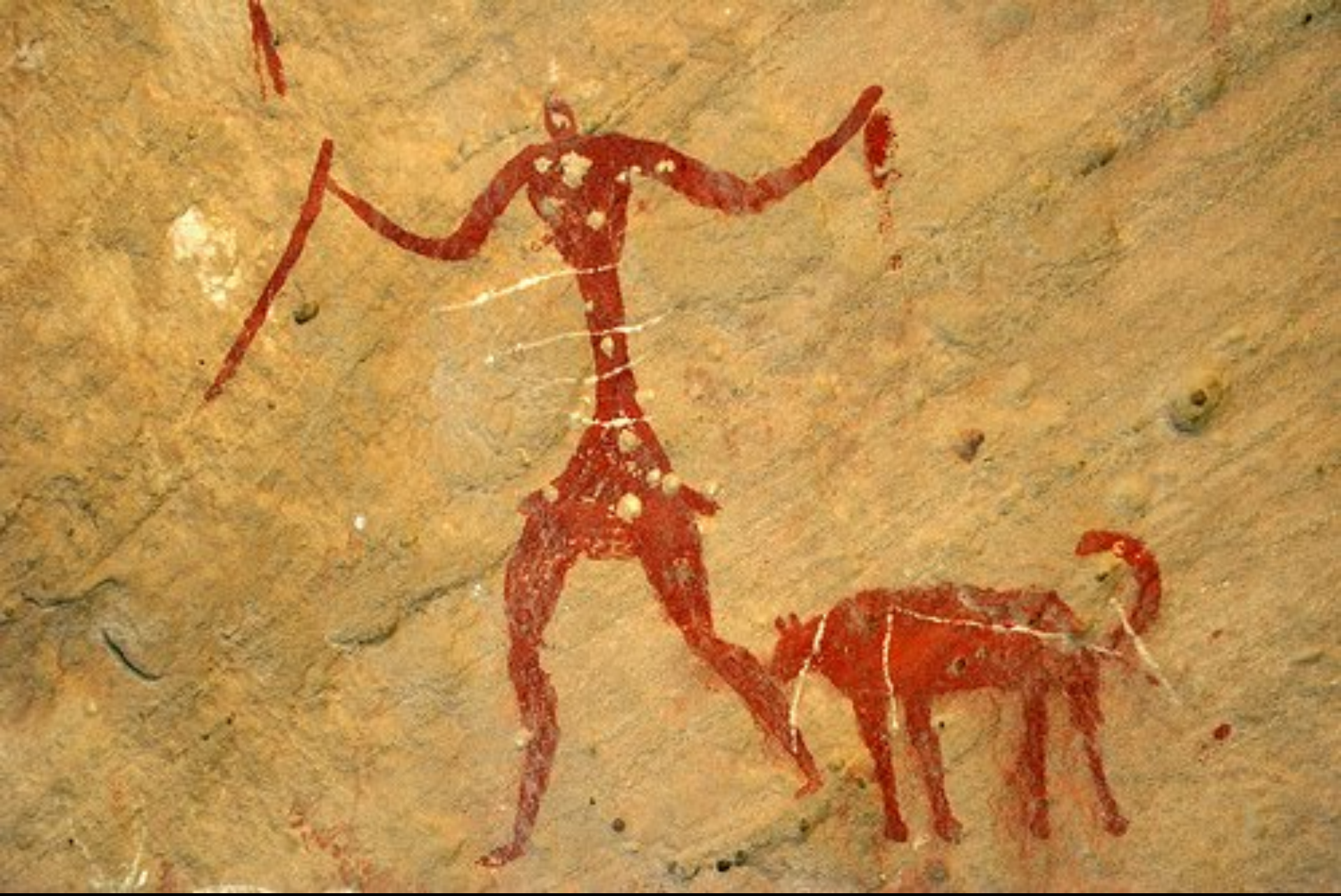
Working Dogs *for* Conservation

2 Objectives:

1. Overview of Conservation Detection Dogs
2. Exploring Possible Application to Brucellosis Mgmt.


© Ron Niebrugge / WildNatureImages.com

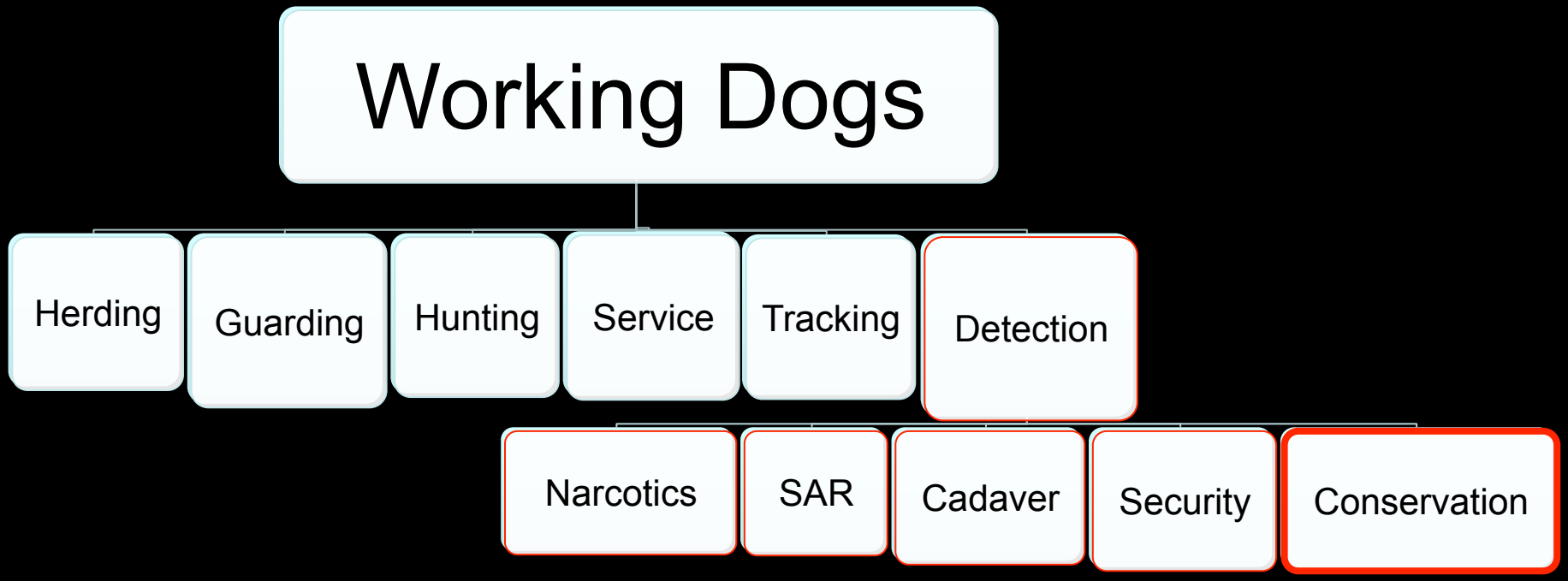

500D




Working Dogs
Herding
Guarding
Hunting
Tracking
Service
Detection

Working Dogs

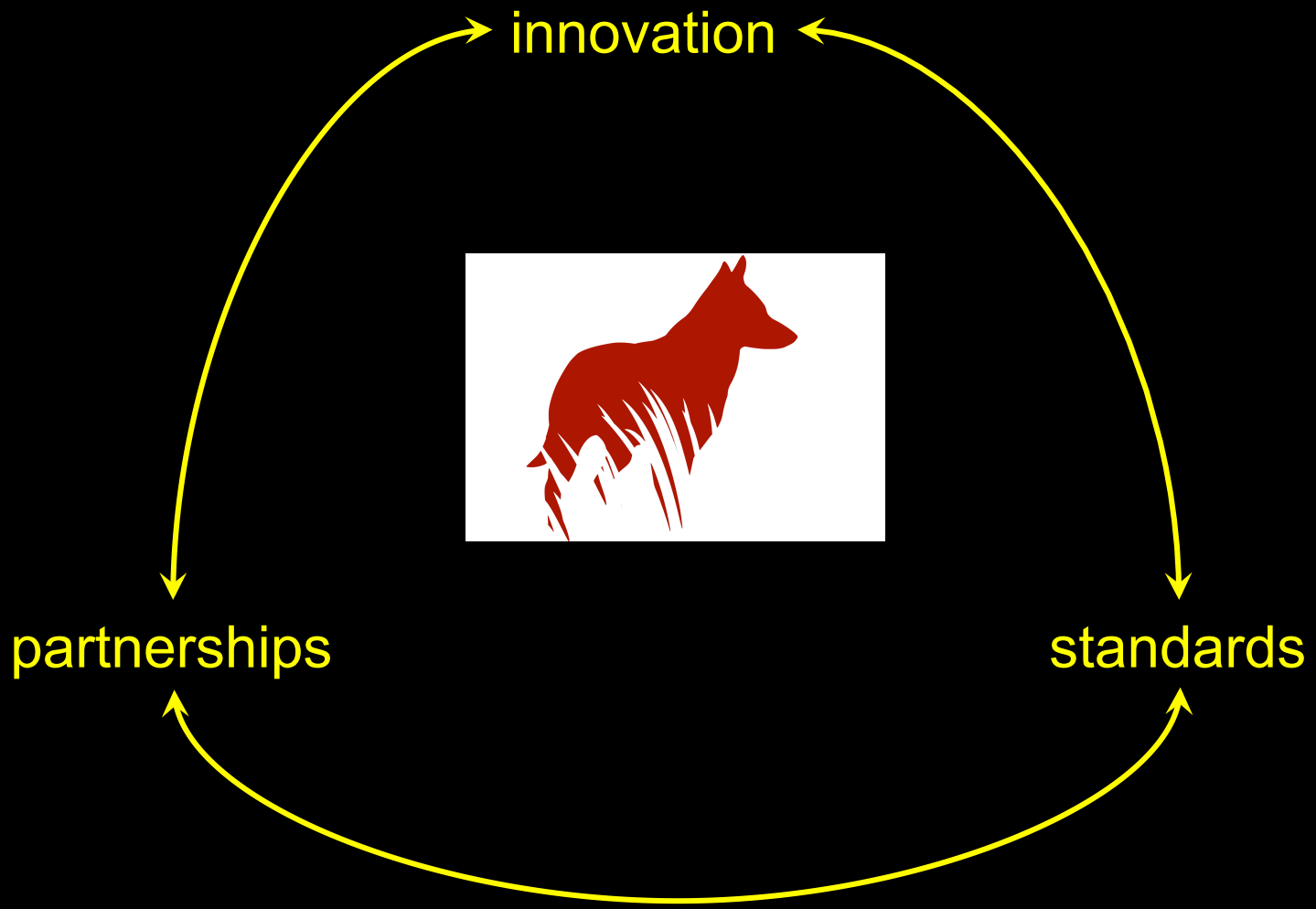
- Herding
- Guarding
- Hunting
- Tracking
- Service
- Detection


Working Dogs
Herding
Guarding
Hunting
Service
Tracking
Detection
Narcotics
SAR
Cadaver
Security
Conservation

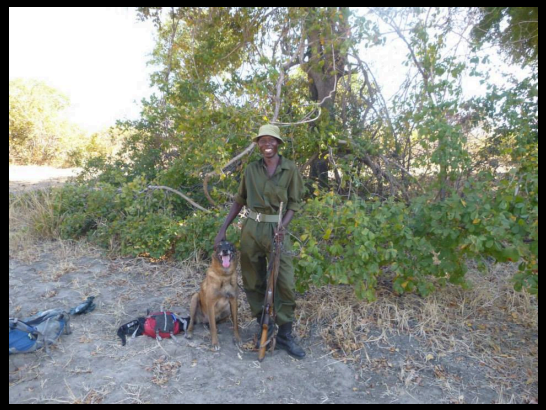
What we do:

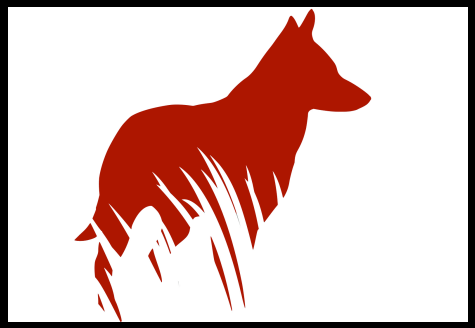
Working Dogs for Conservation applies dogs' extraordinary abilities to further conservation. We do so through innovation, partnerships, standards, and exceptional dogs who live to work.

What we do:



innovation





partnerships

standards

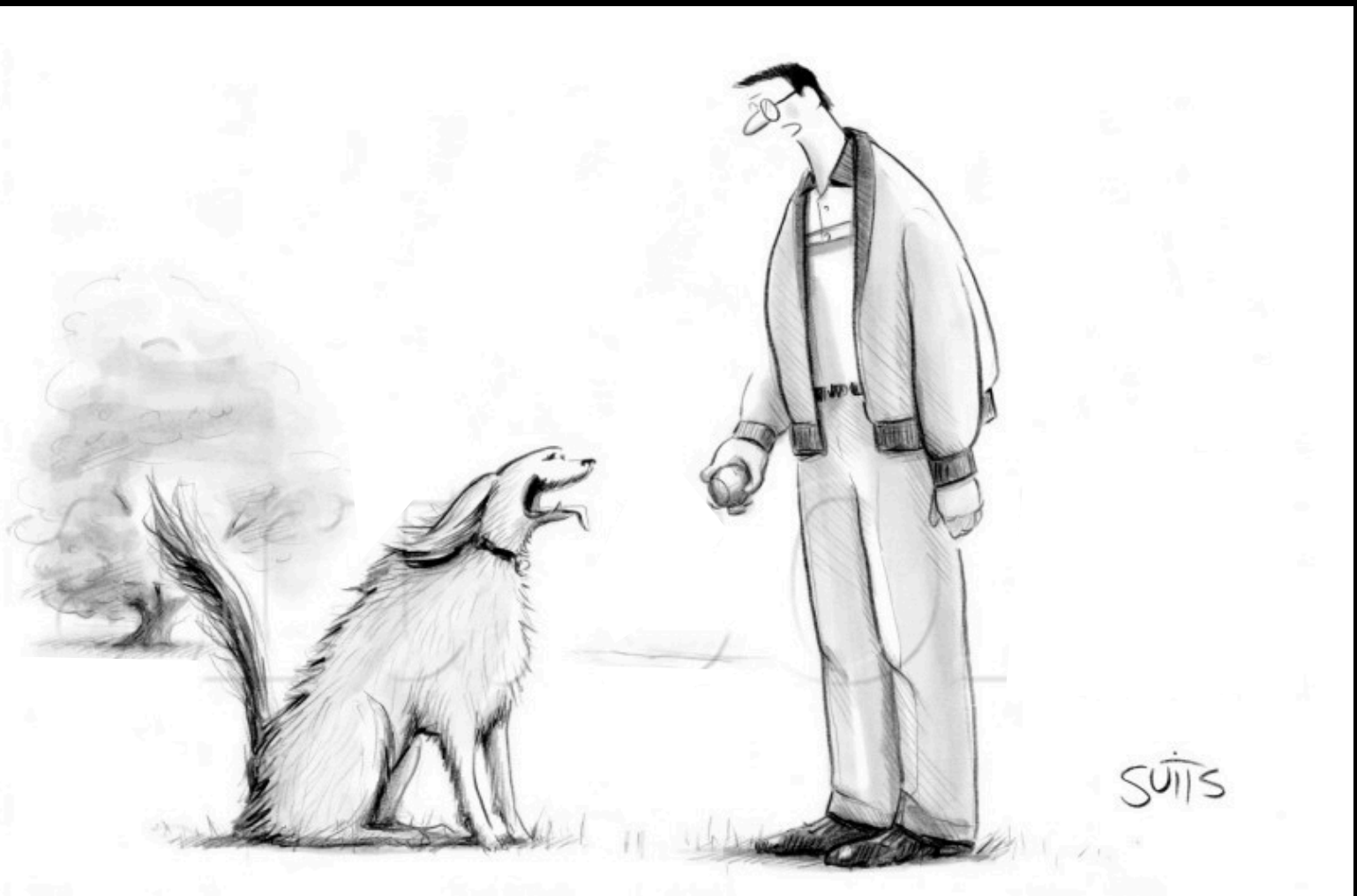
5

Use of Dogs in Wildlife Research and Management

DAVID K. DAHLGREN, R. DWAYNE ELMORE, DEBORAH A. SMITH, AIMEE HURT, EDWARD B. ARNETT, AND JOHN W. CONNELLY

INTRODUCTION

ICDDA



"Let's try it again. This time with a tad less mania."


North Atlantic Ocean
South Atlantic Ocean
Indian Ocean
United States
Canada
Mexico
Brazil
Argentina
Chile
Peru
Bolivia
Paraguay
Colombia
Venezuela
Ecuador
Guatemala
Cuba
Puerto Rico
Nicaragua
Greenland
Iceland
Norway
Sweden
Finland
Russia
United Kingdom
Ireland
Denmark
Germany
Poland
Belarus
Ukraine
France
Spain
Portugal
Italy
Romania
Austria
Greece
Turkey
Kazakhstan
Uzbekistan
Turkmenistan
Mongolia
China
South Korea
Japan
Afghanistan
Pakistan
India
Iran
Iraq
Saudi Arabia
Yemen
Morocco
Algeria
Libya
Egypt
Tunisia
Mauritania
Mali
Niger
Chad
Sudan
Nigeria
Ghana
South Sudan
Ethiopia
Somalia
Kenya
DR Congo
Tanzania
Angola
Zambia
Mozambique
Namibia
Botswana
Zimbabwe
Madagascar
South Africa
Philippines
Malaysia
Indonesia
Australia

100% accuracy: 1,298 / 1,298 kit fox scats correctly ID'd

5x faster than humans finding brown tree snakes

9x more likely than camera traps to detect single bear or bobcat

10x faster finding the first black footed ferret

16x more area searched for black footed ferrets/unit time

36x more likely than hair snares to detect single bear or bobcat

39x more turtles discovered / unit time

Abbreviated References:

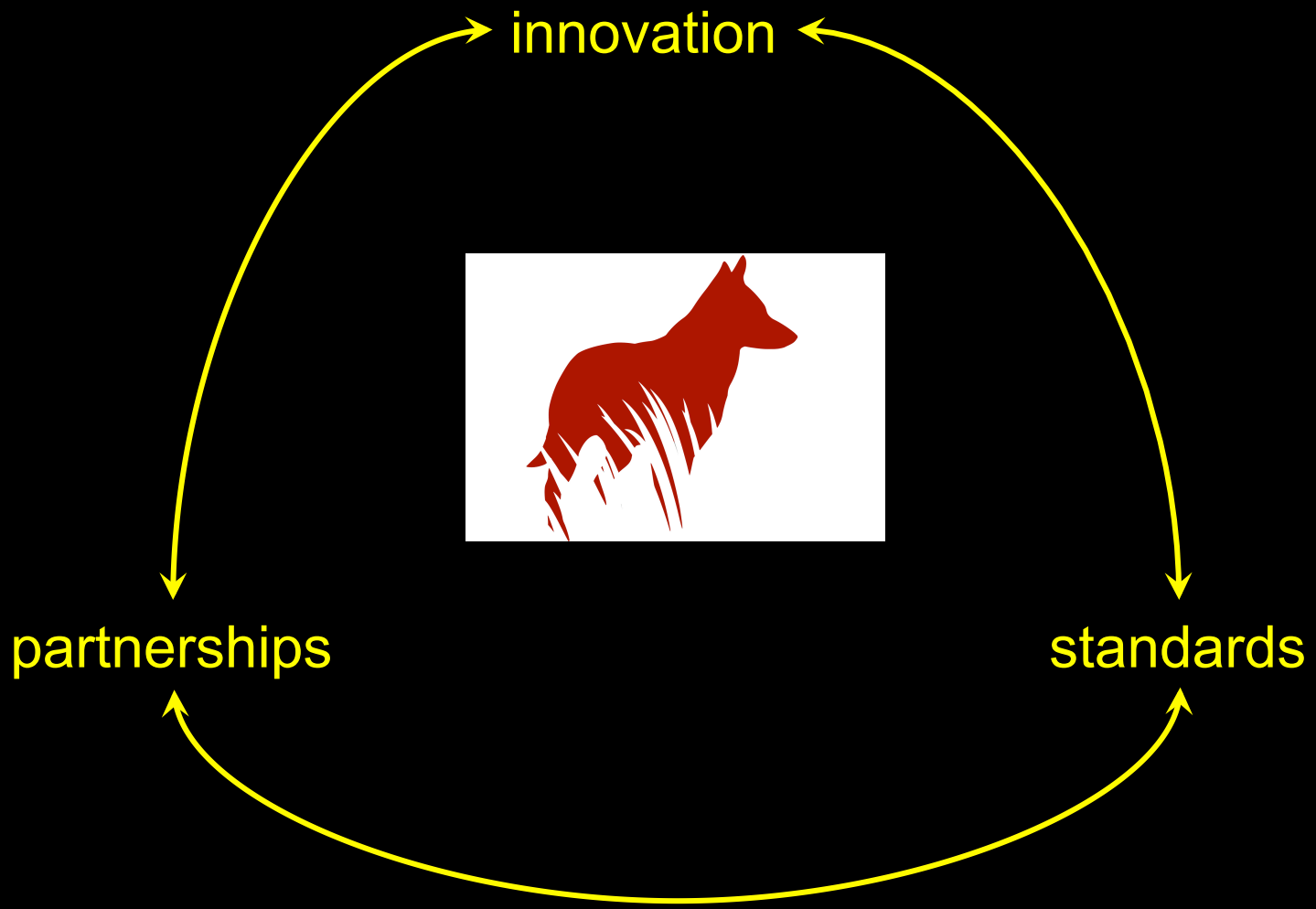
1 Reindl-Thompson et al. 2006. Wildlife Soc. Bulletin.
2 Duggan et al. 2011. J. of Wildlife Mgmt.
3 Kapfer et al. 2012. J. of Herpetological Cons. and Biol.
4 Arnett 2006. Wildlife Soc. Bulletin.
5 Nussear et al. 2008. J. of Herpetological Cons and Biol.
6 Cablk and Heaton. 2006. Ecol. Applications.
7 Savidge et al. 2010. New Zealand J. of Ecology.
8 Goodwin 2010. Invasive Plant Science and Mgmt.
9 Rolland et al. 2006. J. of Cetacean Research and Mgmt.
10 Harrison 2006. Wildlife Soc. Bulletin.
11 Long et al. 2007. J. of Wildlife Mgmt.

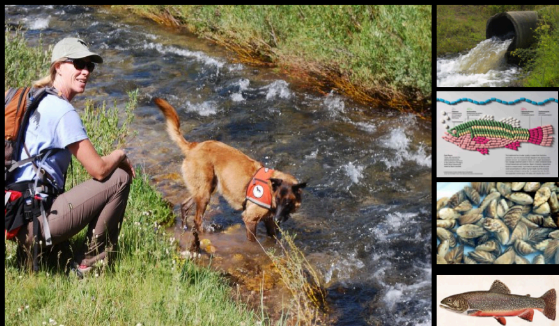

DIABETIC
ALERT DOG

What we do:

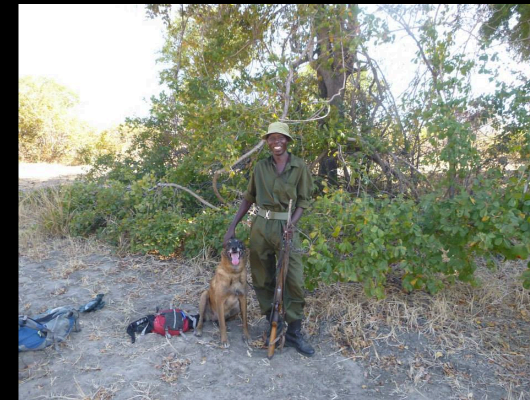
Working Dogs for Conservation applies dogs' extraordinary abilities to further conservation. We do so through innovation, partnerships, standards, and exceptional dogs who live to work.

What we do:



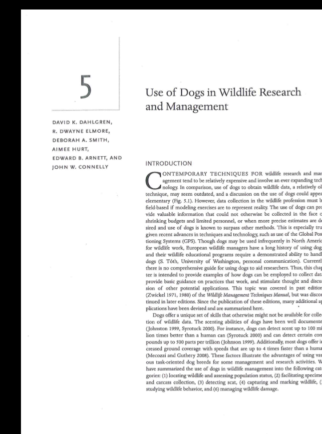


innovation



partnerships

standards


5

Use of Dogs in Wildlife Research and Management

DAVID K. DAHLGREN, R. DWAYNE ELMORE, DEBORAH A. SMITH, AIMEE HURT, EDWARD B. ARNETT, AND JOHN W. CONNELLY

INTRODUCTION

ICDDA

So can dogs help with brucellosis?

- Feasibility Questions:
  - Can dogs detect aborted fetuses?
  - Can dogs detect scat from infectious individuals?
  - Can dogs detect scat from exposed (seropositive? currently / previously infected?) individuals?
  - Can dogs detect *only* infectious (as opposed to exposed) individuals?

So can dogs help (cont'd)?

- Utility Questions:
  - What sort of sampling strategy would be most useful for management (minimizing transmission to livestock and promoting tolerance)?
  - Is monitoring elk a priority?
  - Is it cost effective?
  - Decision support vs. quantitative monitoring?
  - Who is interested? (Front and back of the room)

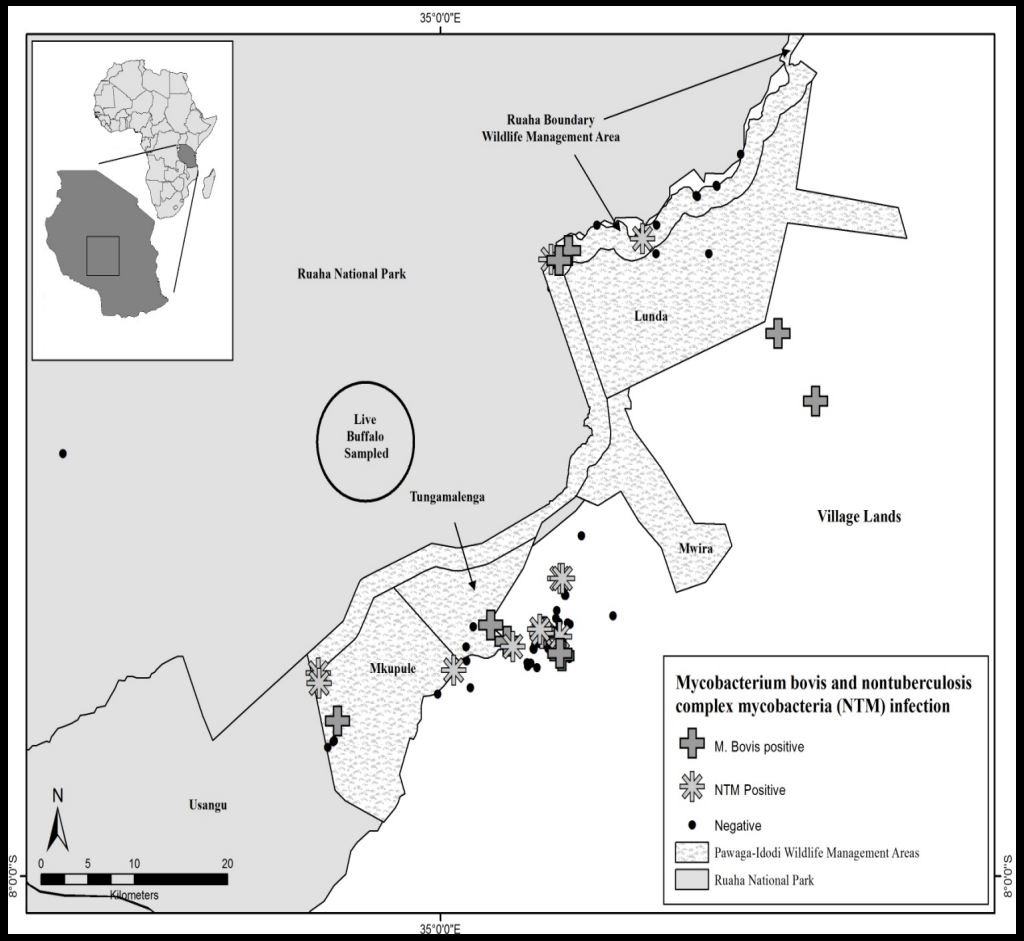
More Questions:

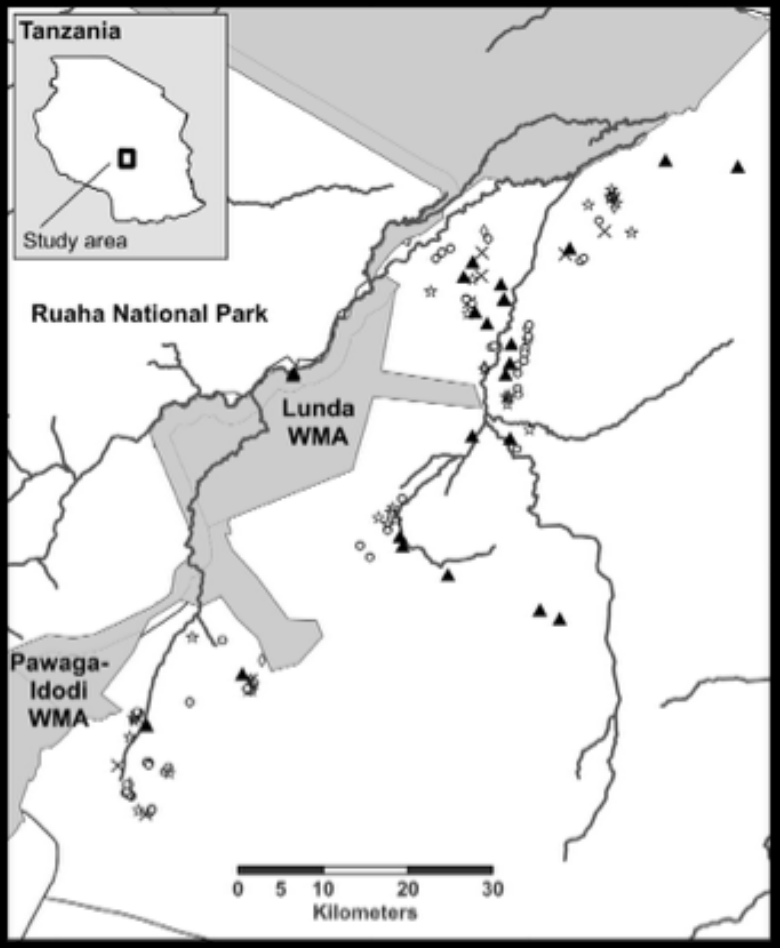
- How to maximize legal and scientific credibility?
- Field vs. Lab sampling strategies?

Possible next steps:

- Evaluate discrimination of scats from experimentally-infected animals
- Evaluate discrimination of exposed (presumably non-infectious animals)
- Field trial detection
- ID useful questions (infectious vs. exposed, etc.)
- Field vs. Lab sampling strategies?

Spatial monitoring:

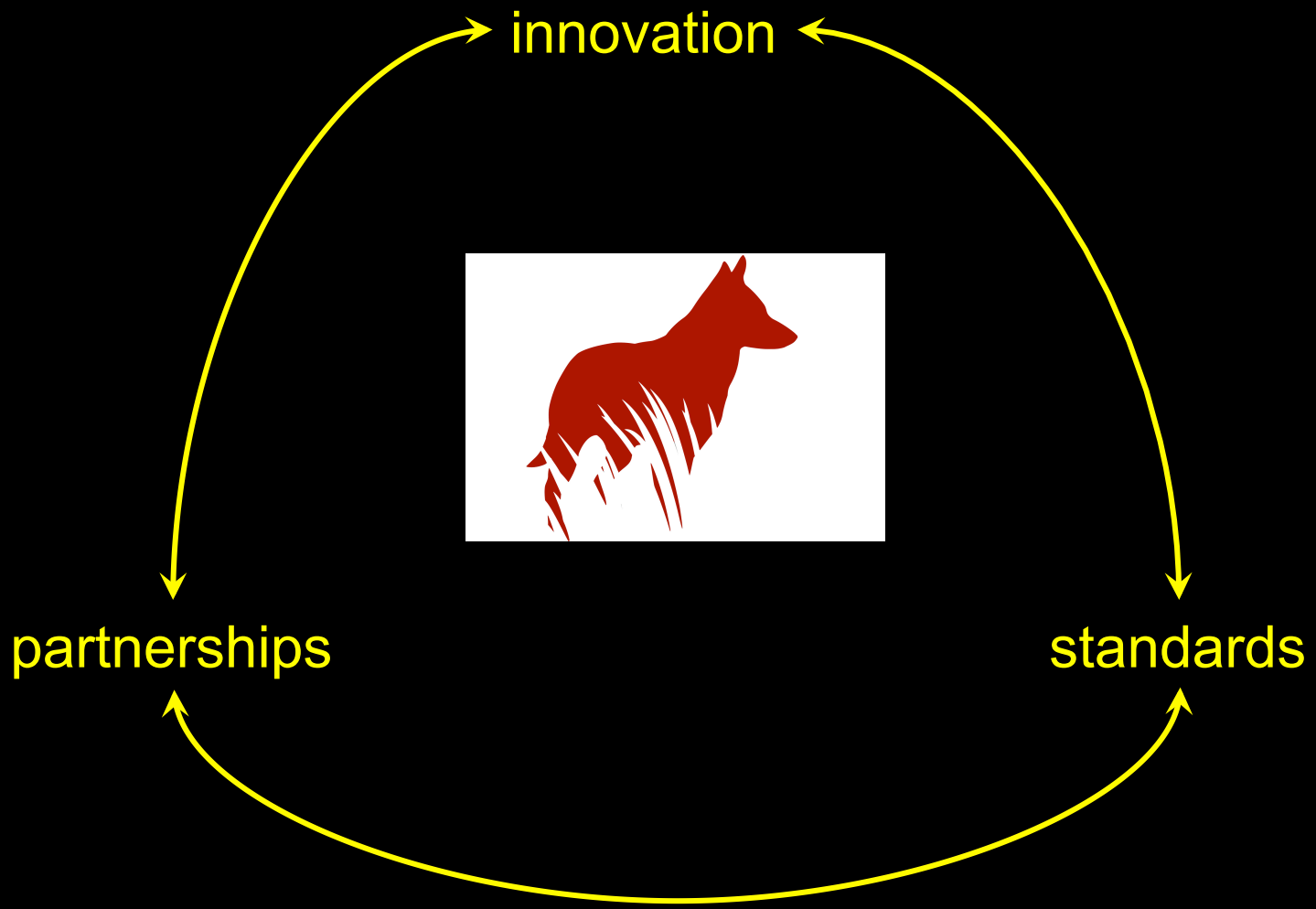




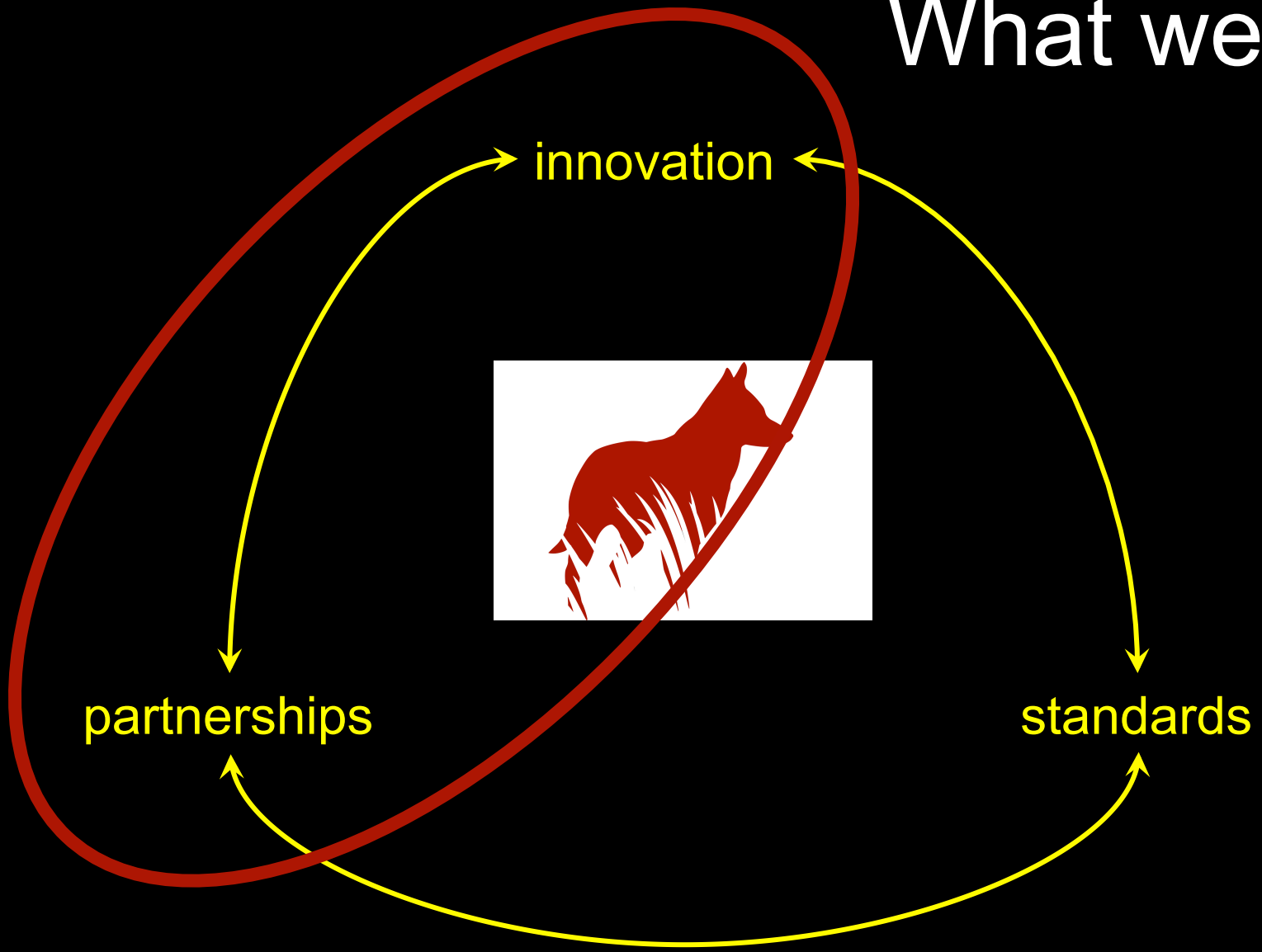
Possible applications:

- Finding aborted fetuses in the landscape
- Comparison of fetus densities in different treatment areas
- Comparisons of % of seropositve (?) / infectious (?) scats through time and space
- Sampling of pastures before livestock enter

What we do:



What we do:



Concerns about using dogs:

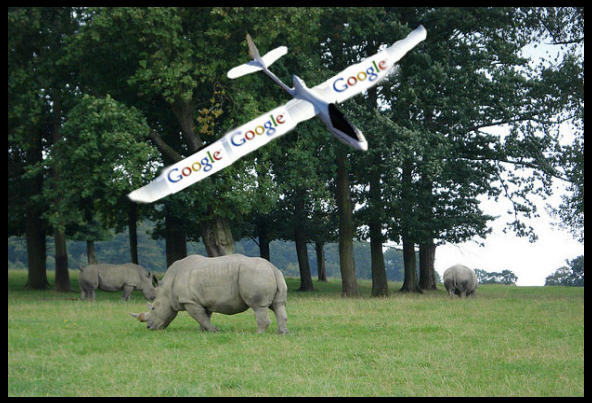
Safety for the Target Species and dogs

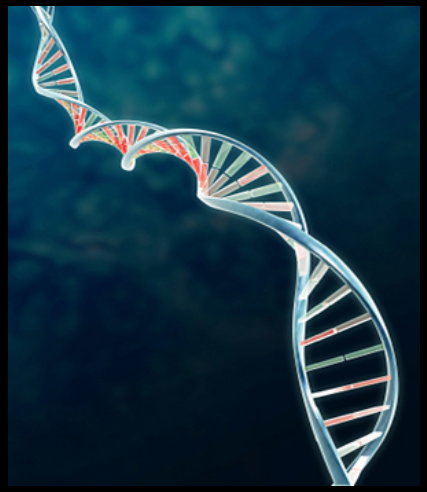
Safety for Other Species

Detecting Non-target species (false positives)

Cross-Site Contamination

Dogs can complement existing & future technology:





When to use dogs:

- Efficiency
  - Low density
  - Structurally complex habitat
  - Cryptic species (nocturnal, camouflaged, tiny)
  - Hard to discriminate (sp., sex, reproductive status)
- Accuracy
- Varied search environments and search strategies
- Long duty cycles
- Simultaneous searching for multiple targets
- Seeking many targets over career

For a successful dog project:

Known Seasonality and Natural History of the Target

Known Training Samples

Safety while working
(temperature, natural hazards, disease)

Confirmation in the Field

Best practices for conservation detection dogs:

Multiple Dogs for Each (novel) Target

Long-Term Trainer/Handler Relationship

Ethical Handling and Husbandry

Structured (rigorous!) Survey Design

ICDDA Membership

Pete Coppolillo, Ph.D.
Executive Director
Working Dogs for Conservation
Pete@WorkingDogsForConservation.org
+1 406 290 9453

WD4C.org

Alice@WorkingDogsForConservation.org
+1 406 539 8972