

The background of the slide is a collage of various wildlife. In the top left, a shark is shown breaching the water. In the top right, a large bald eagle is shown in profile. In the middle right, a brown bear is shown with a small owl perched on its back. In the bottom left, a walrus is shown. In the bottom center, a group of white birds, possibly gulls, is shown on a rocky shore. The text is overlaid on this collage.

**National Fish & Wildlife
Forensics Laboratory**

**Wildlife Trace Evidence
or
CSI in a Box**

**by
Ken Goddard
Laboratory Director**

Definitions ...

The background of the slide is a faded, light-colored image of a museum diorama. On the left, a shark is shown swimming in a tank. In the center, there are several birds, possibly ducks or geese, on a rocky shore. On the right, a large brown bear is depicted in a naturalistic setting. The overall scene is a composite of various animal species in a naturalistic environment.

Trace Evidence: A term used to describe 'small', oftentimes microscopic physical evidence

--- The Forensic Anthropology Laboratory

Definitions ...

The background of the slide is a collage of nature-related images. On the left, there's a shark swimming in the water. In the center, a bear is visible. On the right, a sloth is shown. At the bottom, there are several birds, including what looks like a duck or goose. The overall tone is light and naturalistic.

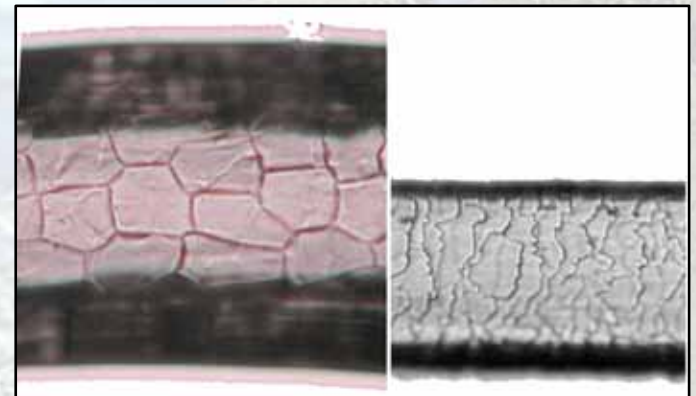
Trace Evidence: A discipline of forensic science accredited by ASCLD/LAB

ASCLD / LAB Requirement ...

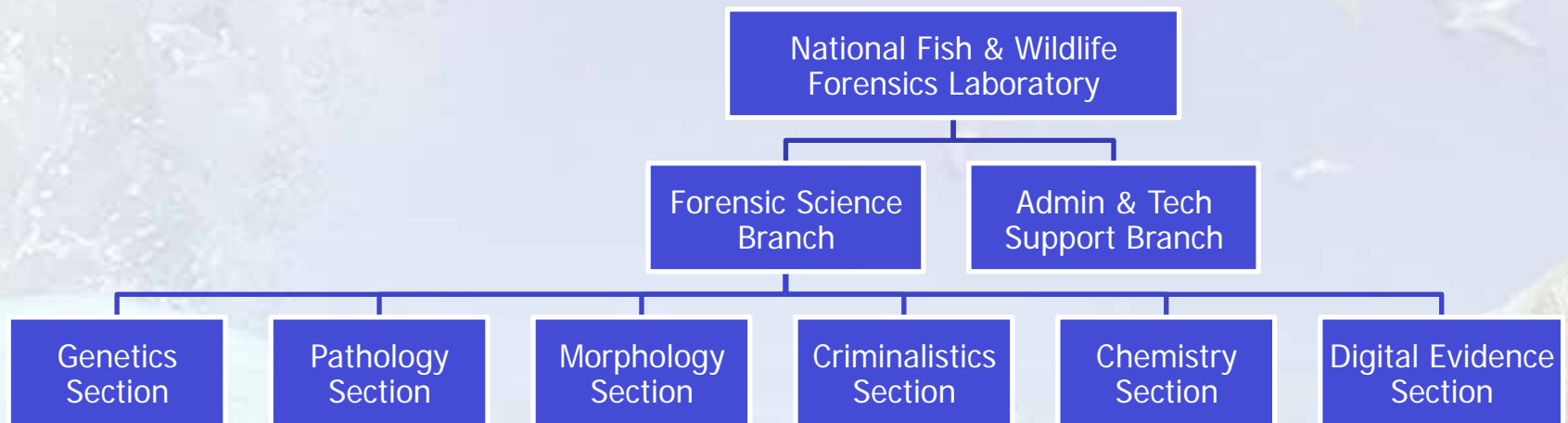
The background of the slide is a faded, semi-transparent image of a zoo enclosure. On the left, a shark is visible in a pool of water. In the center and right, there are several birds, including a large bald eagle in the foreground on the right and several smaller birds on the ground. A large brown bear is also visible in the lower right area.

A laboratory must apply for accreditation
in all disciplines in which
ASCLD/LAB provides accreditation
and the laboratory provides services

We do conduct trace analysis ...



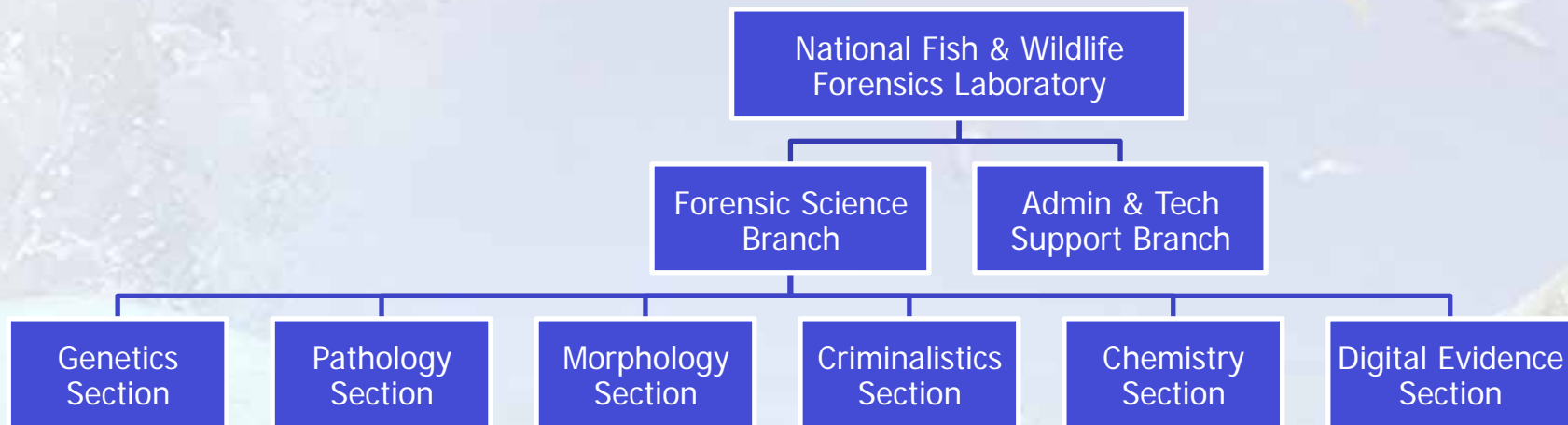
Our Organizational Structure ...



Identification and comparison of hair



Our Organizational Structure ...



↑
Identification and comparison of
hair **and hides, fur, feathers,**
claws, teeth, shells, scales,
horns, tusks, bones and skulls

This was a bit of a problem ...

... when we underwent our first ASCLD/LAB inspection



Our Definition of Trace Evidence ...

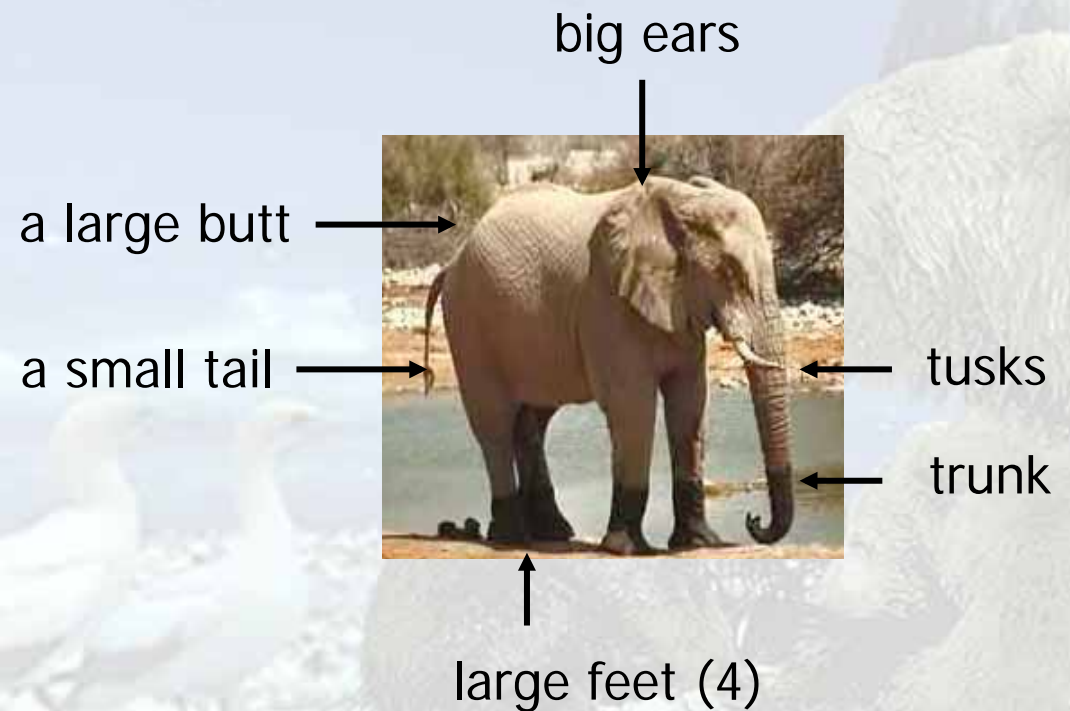
... a **part or product of** (for example) **an Elephant**, because it isn't the whole elephant ... depending on how you define such a thing.



Definitions are going to be even more of a problem ...

... when we attempt to be accredited under the ASCLD/
LAB-*International* accreditation process which includes
ISO/IEC 17025:2005 ...

... because precise
definitions are very
much an issue with ISO/
IEC 17025:2005 ...



The definition of a wolf???



Definitions continued ...

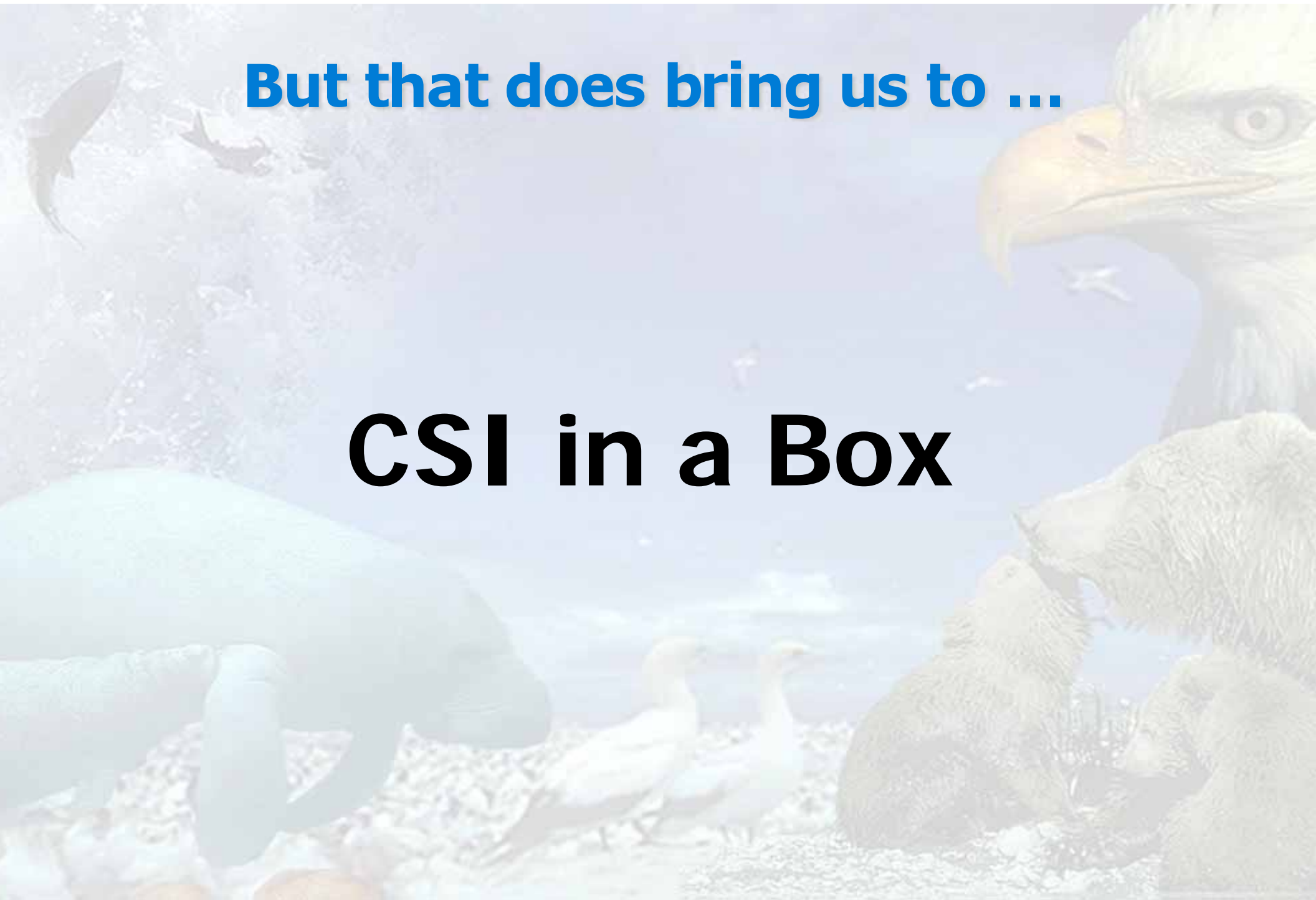
CSI: A discipline of forensic science optionally accredited by ASCLD/LAB.

CSI: The collection of trace --- and other --- evidence items within a defined boundary (scene perimeter) for the purpose of reconstructing the events of a crime ... and linking suspect, victim and crime scene.

CSI: A TV show that ...

But that does bring us to ...

CSI in a Box



A Successful Seizure ...



But perhaps also a missed opportunity ...

Had those 4 boxes remained unopened..

- ❑ **Four perfectly preserved crime scenes**
- ❑ **An opportunity --- using CSI techniques --- to ...**
 - determine country source of tusks
 - ID suspects (poachers, transporters, buyers)
 - Link suspects, victims and crime scenes

A New Opportunity ... *

- ❑ Four locked metal boxes
- ❑ Per X-Ray: they all contain elephant tusks
- ❑ Monitored Route:
 - Lusaka to Addis Ababa
 - Addis Ababa to Bangkok
 - Bangkok to Hong Kong
 - Hong Kong to Singapore
 - Singapore to ... (shipment seized)*
- ❑ Diverted Route:
 - Singapore to USFWS Forensics Lab

* Thanks to Interpol Wildlife Crime Program Manager Peter Younger



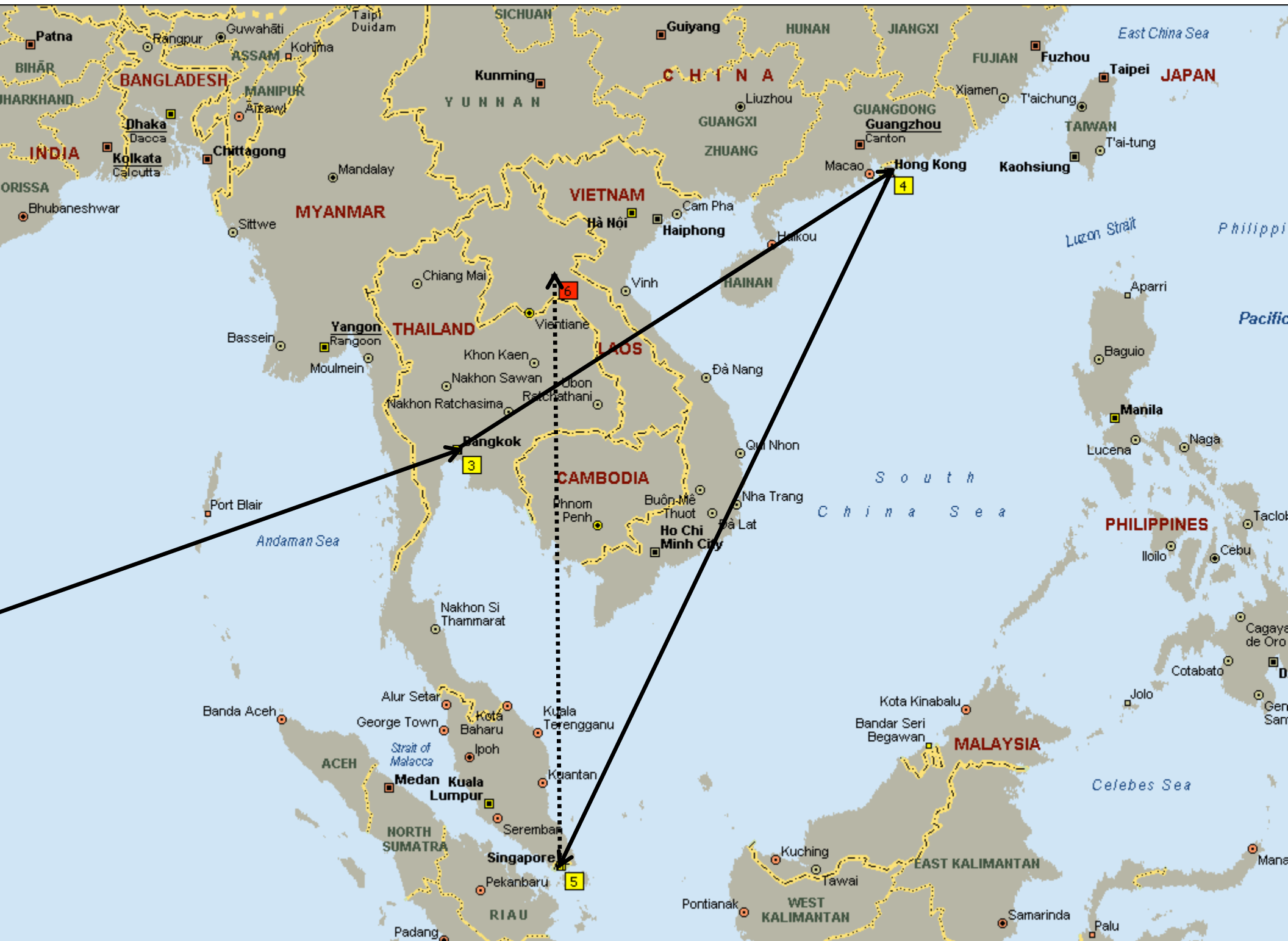
1

2

3

4

5



3

4

6

5



Arctic Ocean

RUSSIA

CANADA

ALASKA

YUKON TERRITORY

NORTHWEST TERRITORIES

Bering Sea

Sea of Okhotsk

UNITED STATES

OREGON

Pacific Ocean

TAYMYR

SAKHA

CHUKOT

EVENKI

MAGADAN

KORYAK

IRKUTSK

Krasnoyarsk

CHITA

AMUR

KHABAROVSK

TUVA

MONGOLIA

Shenyang

Pyongyang

Sapporo

CHINA

Lanzhou

Taiyuan

Beijing

Daegu

Jeju

Chongqing

Wuhan

Xi'an

Chengdu

Kunming

Hong Kong

Taipei

Kaohsiung

Dhaka

Yangon

Bangkok

Manila

Iloilo

Ho Chi Minh City

Kota Kinabalu

Palikir

Majuro

Bairiki

Funafuti

MYANMAR

Hà Nội

Đà Nẵng

PHILIPPINES

PALAU

FEDERATED STATES OF MICRONESIA

KIRIBATI

Kota Baharu

Medan

Singapore

INDONESIA

PAPUA NEW GUINEA

SOLOMON ISLANDS

Jakarta

Surabaya

Makassar

Darwin

Port Moresby

ANU

Guatemala

MEXICO

Monterrey

Dallas

Oklahoma City

Phoenix

Denver

San Francisco

Urümqi

Ülaanbaatar

Ulaan Bator

Harbin

Ch'ongjin

Yakutsk

Magadan

Petropavlovsk-Kamchatskiy

Anchorage

Seattle

Los Angeles

San Francisco

Edmonton

Calgary

Yakutsk

Magadan

Petropavlovsk-Kamchatskiy

Anchorage

Seattle

Los Angeles

San Francisco

Edmonton

Calgary

Regina

Montreal

Ottawa

Quebec

Halifax

Yakutsk

Magadan

Petropavlovsk-Kamchatskiy

Anchorage

Seattle

Los Angeles

San Francisco

Edmonton

Calgary

Regina

Montreal

Ottawa

Quebec

Halifax

Yakutsk

Magadan

Petropavlovsk-Kamchatskiy

Anchorage

Seattle

Los Angeles

San Francisco

Edmonton

Calgary

Regina

Montreal

Ottawa

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Yakutsk

Magadan

Petropavlovsk-Kamchatskiy

Anchorage

Seattle

Los Angeles

San Francisco

Edmonton

Calgary

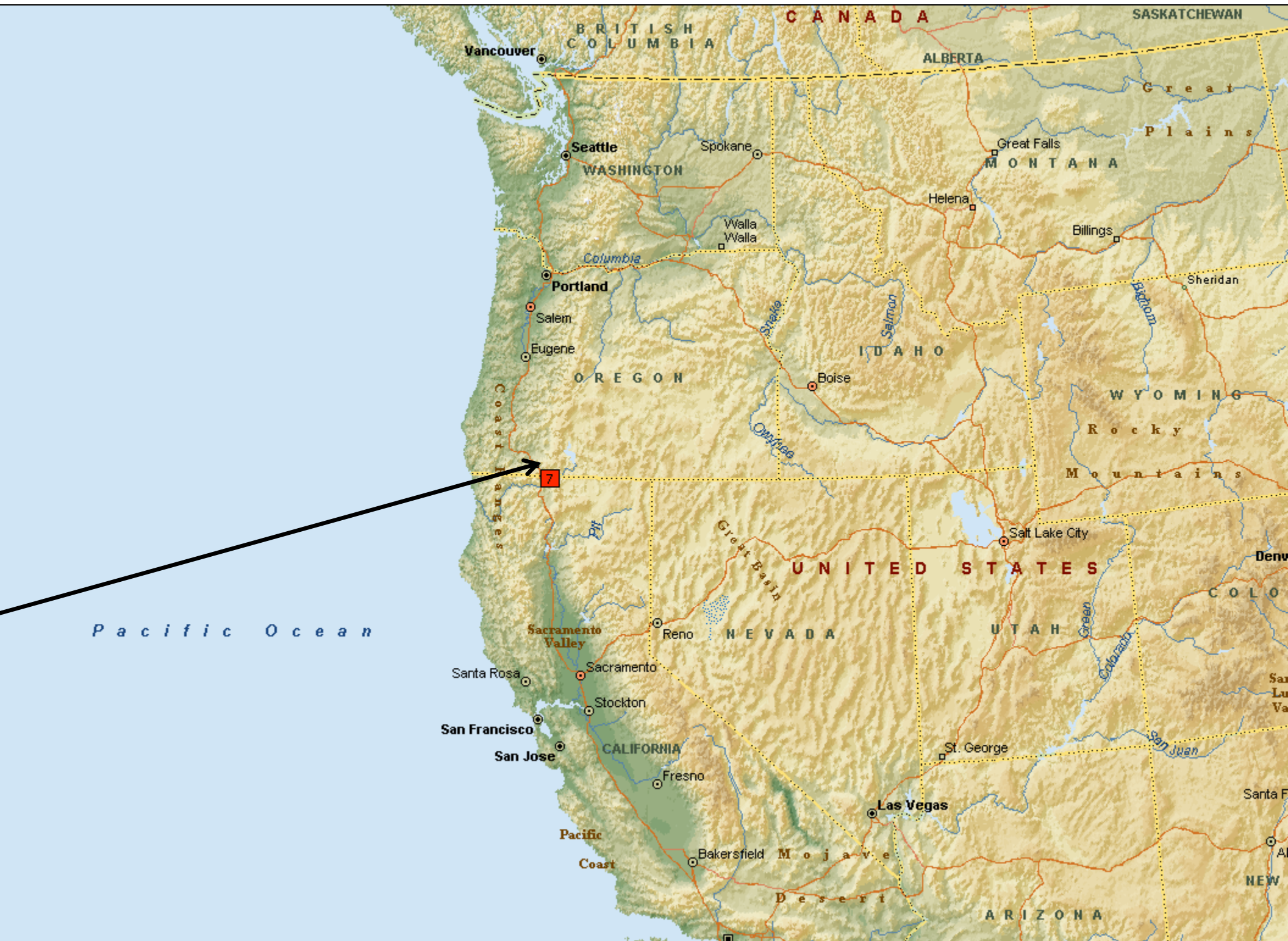
Regina

Montreal

Ottawa

Quebec

Halifax



The U.S. National Fish & Wildlife Forensics Laboratory

Ashland, Oregon, USA



137 kilometers (85 miles)

The U.S. National Fish & Wildlife Forensics Laboratory

Ashland, Oregon, USA

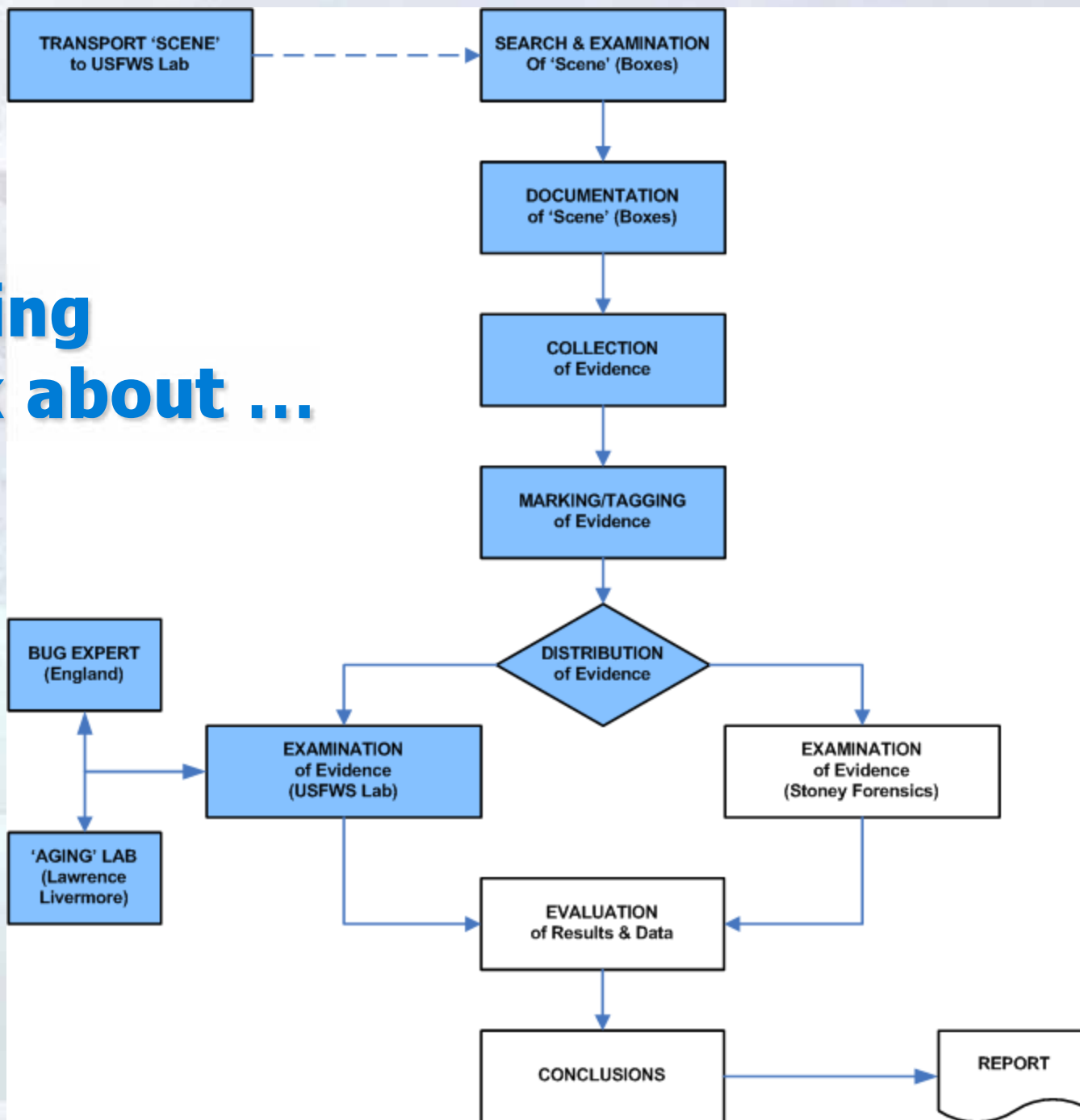


TRANSPORT 'SCENE'
to USFWS Lab

Four 'Crime Scenes' arrive at the USFWS Lab



I'm going to talk about ...



TRANSPORT 'SCENE'
to USFWS Lab

Transfer Box to Bio-Safety Level 3 Lab



Photo credit: Les Craven, Medford Tribune

External Evidence & Safety Monitor:
Dr. Ed Espinoza (USFWS Deputy Lab
Director)

Search Team: Mike Scanlan (Senior Firearms
Examiner), Ken Goddard (Lab Director), Dave
Stoney (Stoney Forensics), Andy Reinholz
(Latent Print Examiner)



SEARCH & EXAMINATION
Of 'Scene' (Boxes)

Removing Outer Wrappings



DOCUMENTATION
of 'Scene' (Boxes)

Photographing Box Exterior



SEARCH & EXAMINATION
Of 'Scene' (Boxes)

Examining Box Exterior



Photo credit: Les Craven, Medford Tribune

SEARCH & EXAMINATION
Of 'Scene' (Boxes)

Opening the Box



Photo credit: Les Craven, Medford Tribune



SEARCH & EXAMINATION
Of 'Scene' (Boxes)

Removing Padding



DOCUMENTATION
of 'Scene' (Boxes)

Photographing Box Interior



SEARCH & EXAMINATION
Of 'Scene' (Boxes)

Removing Tusks from Box



SEARCH & EXAMINATION
Of 'Scene' (Boxes)

Lab Observers



Photo credit: Les Craven, Medford Tribune

SEARCH & EXAMINATION
Of 'Scene' (Boxes)

Communications



Photo credit: Les Craven, Medford Tribune



Photo credit: Les Craven, Medford Tribune

Communications

(Plan B)*

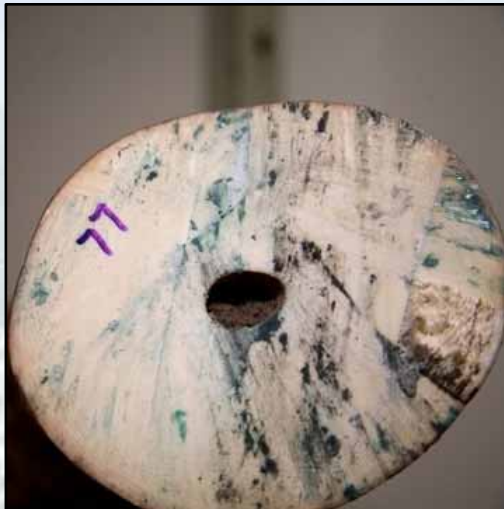
*** AKA:
learning to write
backwards**



**Basic element of CSI:
If things can go
wrong ...**

Photo credit:
Les Craven, Medford Tribune

Marking the Tusks



SEARCH & EXAMINATION
Of 'Scene' (Boxes)

Examining the Tusks



DOCUMENTATION
of 'Scene' (Boxes)

Photographing the Tusks



COLLECTION
of Evidence

Collecting Trace Evidence



Photo credit: Les Craven, Medford Tribune

I should explain ...



The “Terrifying Little Red Spider” Collection Process...



Piece of Scotch™ Tape

DOCUMENTATION
of 'Scene' (Boxes)

All of the Tusks from the Four Boxes



DOCUMENTATION
of 'Scene' (Boxes)

All of the Tusks from the Four Boxes



DOCUMENTATION
of 'Scene' (Boxes)

All of the Tusks from the Four Boxes



Initial Tusk Evidence Summary

75 Elephant Tusks

- 27 **matched sets** of tusks
- 21 **individual** tusks (not matched to a set)
- 74 are African Elephant
- 1 may be Asian Elephant

3 tusks charred

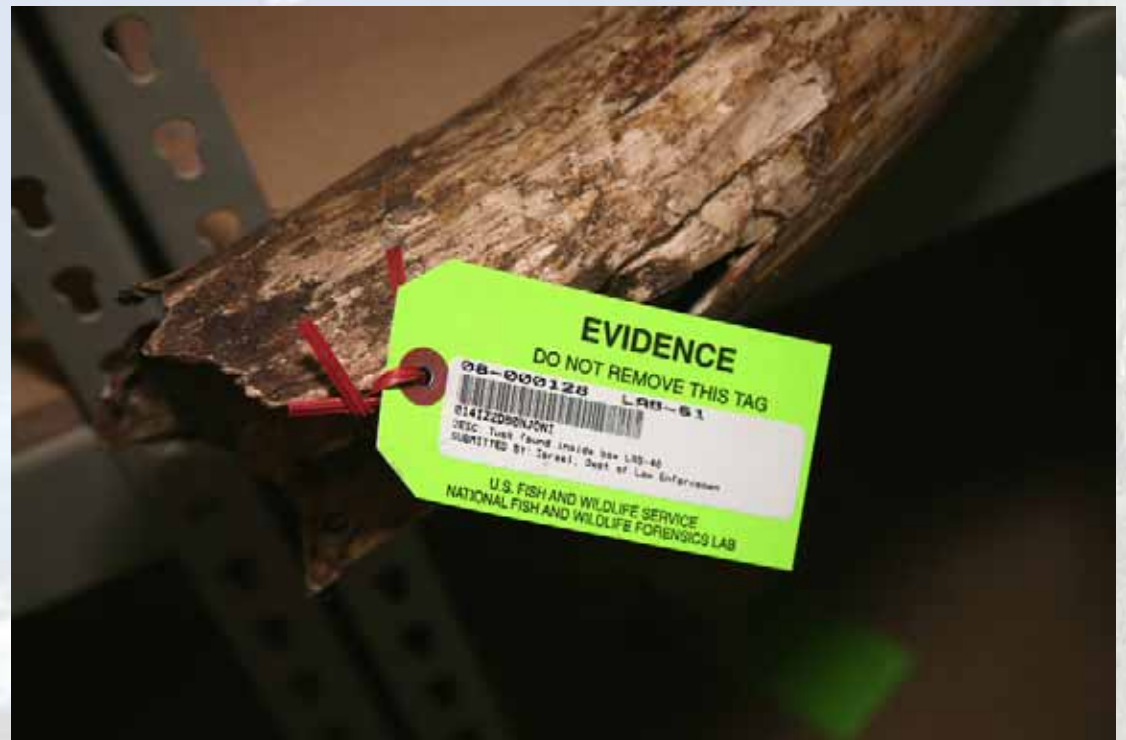
4 tusks with 'probable' bullet impact points

1 tusk bearing human/primate blood

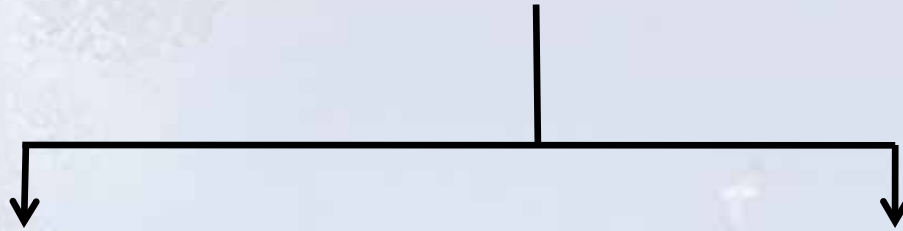
1 tusk with red paint smear

MARKING/TAGGING
of Evidence

Tagging the Evidence



Distribution of the Evidence



USFWS Forensics Lab

- Boxes
- Tusks
- Padding
- Insects

Stoney Forensics Inc

- Dirt
- Pollen
- Plant Materials

EXAMINATION
of Evidence
(USFWS Lab)

Latent Print Processing



Latent Print Results



Bloody Print on
Partial Tusk (LAB#32)

Metal Box (LAB#1)



Metal Boxes

Box 1 [LAB#1]:



Box 2 [LAB#21]:



Box 3 [LAB#48]:



Box 4 [LAB#69]:



Metal Boxes

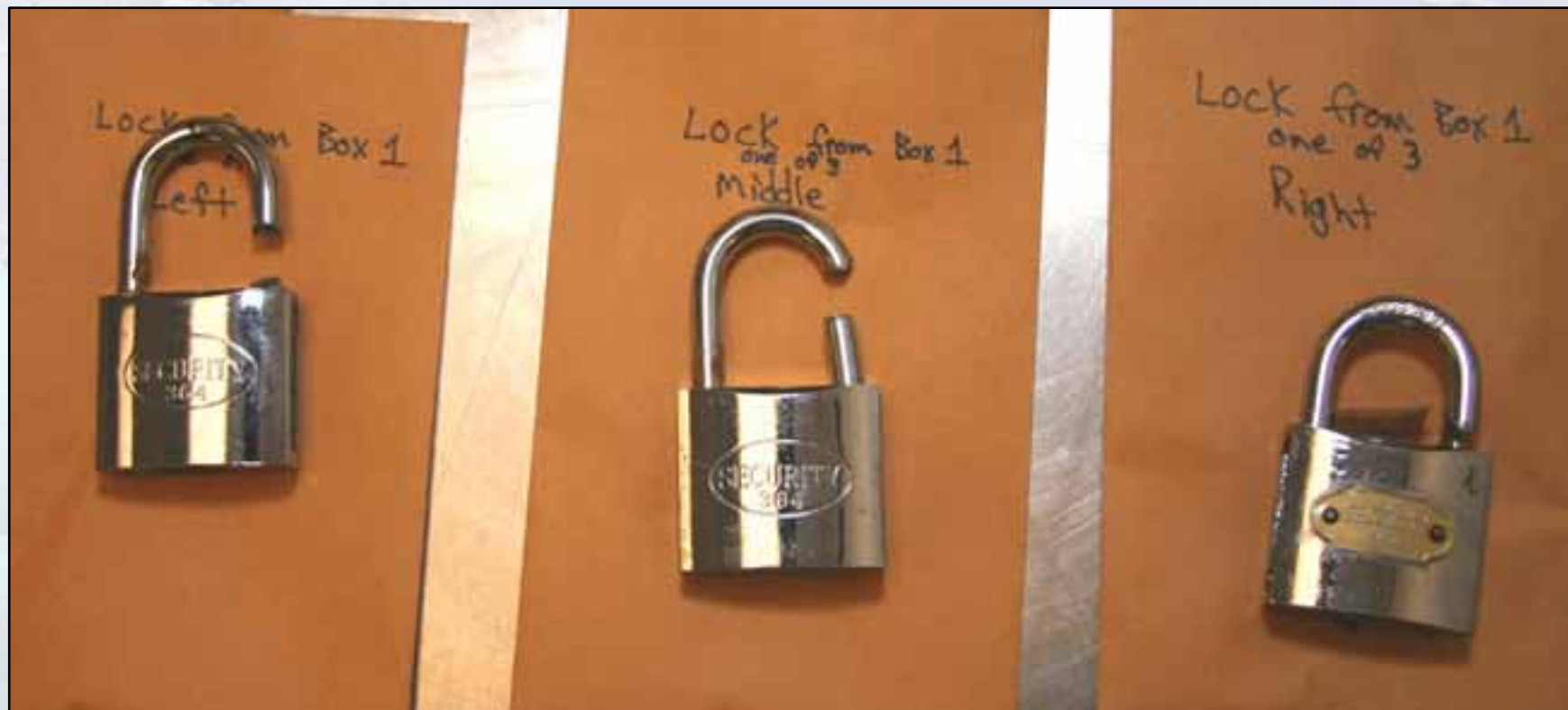
Dimensions: Length x Width x Depth

BOX	Inches L	W	D	Cm. L	W	D
LAB-01	51.25	14.5	16.5	130	37	42
LAB-21	51.25	14.5	17.25	130	37	44
LAB-48	59.25	11	18	150	28	46
LAB-69	35.25	15.75	13.5	90	40	34

Box material: 0.036" (0.92 mm) painted steel

The Padlocks

"Security 364" Chrome-coated



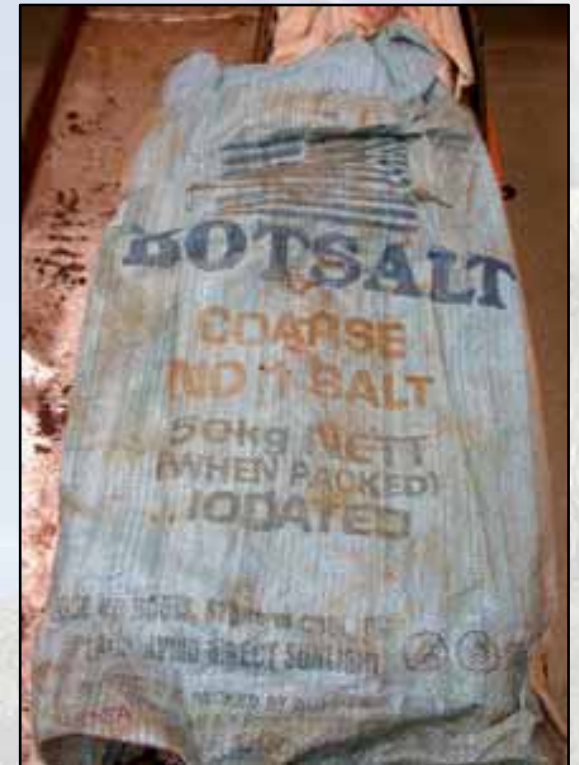
Box Padding



Zambia



Vietnam



Botswana

Box Padding



Zambia



Flour bag
???

Impact Marks on Tusks ... bullets or cuts?



Very probable
bullet impact
point



??



Very probable
cementum scraping
(machete?)

EXAMINATION
of Evidence
(USFWS Lab)

Bullet Impact Marks on Tusks (test)



EXAMINATION
of Evidence
(USFWS Lab)

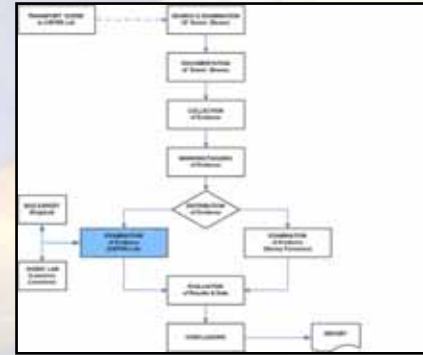
Machete Impact Marks on Tusks (test)



Knife Impact Marks on Tusks (test)



Axe Impact Marks on Tusks (test)



EXAMINATION
of Evidence
(USFWS Lab)

Examining Impact Marks on Tusks (phase 1)



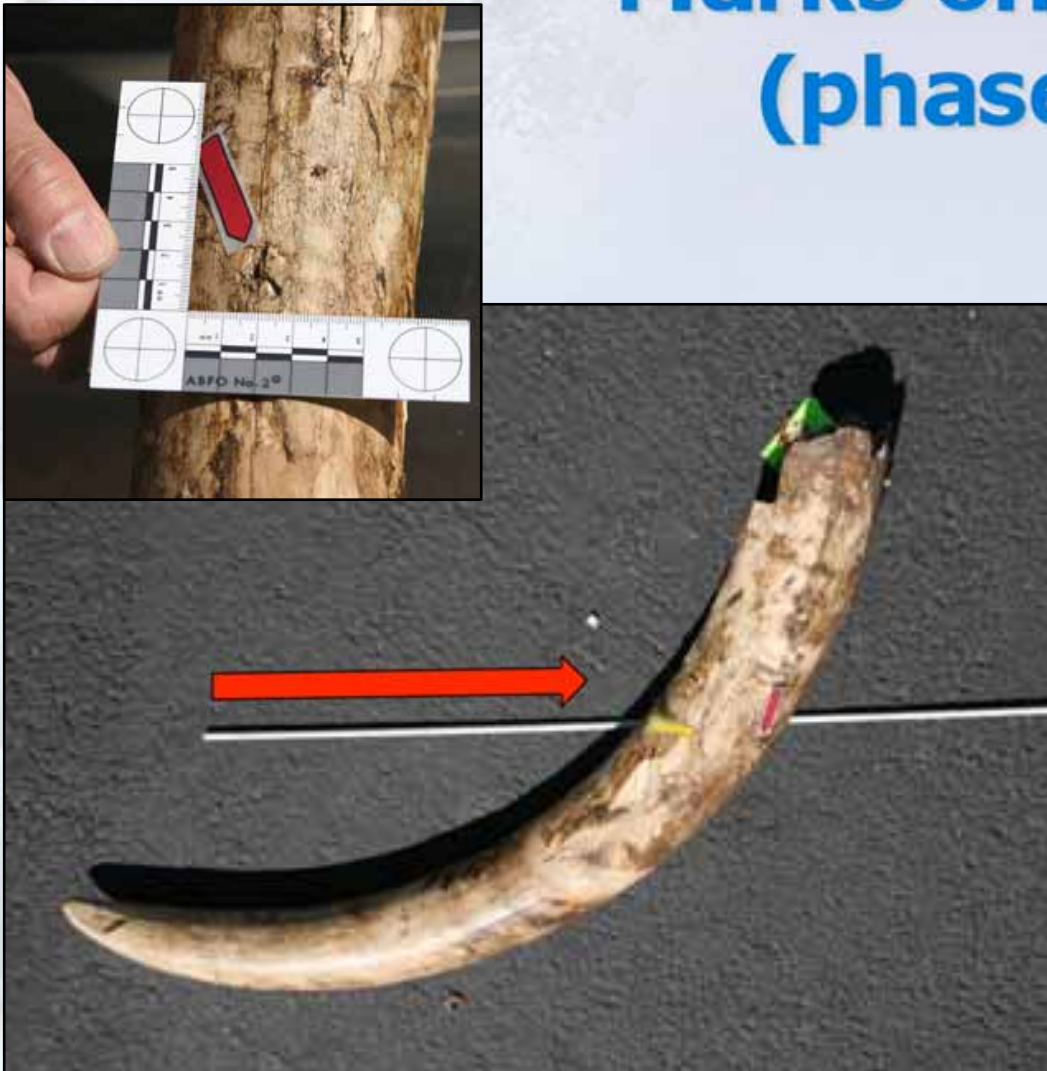
EXAMINATION
of Evidence
(USFWS Lab)

Pressure-washing Tusks



EXAMINATION
of Evidence
(USFWS Lab)

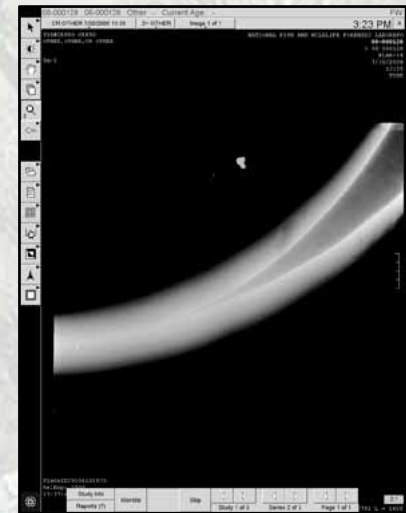
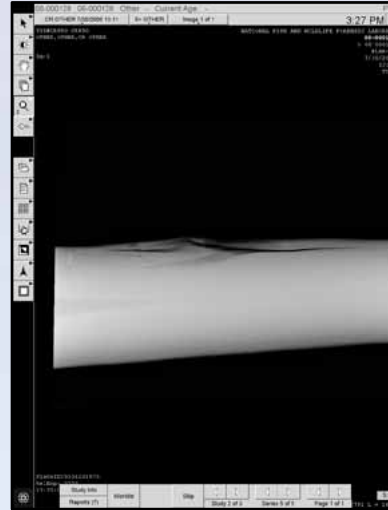
Examining Impact Marks on Tusks (phase 2)



Examining Impact Marks on Tusks (phase 2)



X-Raying Tusks



No bullets found
within impacted tusks



Paint Smears



Did the paint come from the bed of a specific model of truck?

No ... probably not ...
paint is water-soluble

BUG EXPERT
(England)

Insects

The insects found in tusk cavities were sent to:

Department of Entomology
Natural History Museum
London, England, UK

Insects

Blowfly (*Chrysomya albiceps*)



Range:

Mostly African species that occurs northwards into southern Europe and the Middle East, and eastwards toward northwestern India.

Insects

Small & Minute Dung Flies (pupae) (*Chrysomya albiceps*)



Red Planet Inc

Range:

World wide.

Insects

Army (Driver) Ant [minor worker] (*Dorylus sp.*)



Range:

Throughout Africa.

Insects

Sheep Blowfly (*Lucilia cuprini*)



Range:

Widely ranged,
including Australia,
Europe and
southern Africa.

BUG EXPERT
(England)

Insects

???

Range: ??



'AGING' LAB
(Lawrence
Livermore)

Carbon-Dating



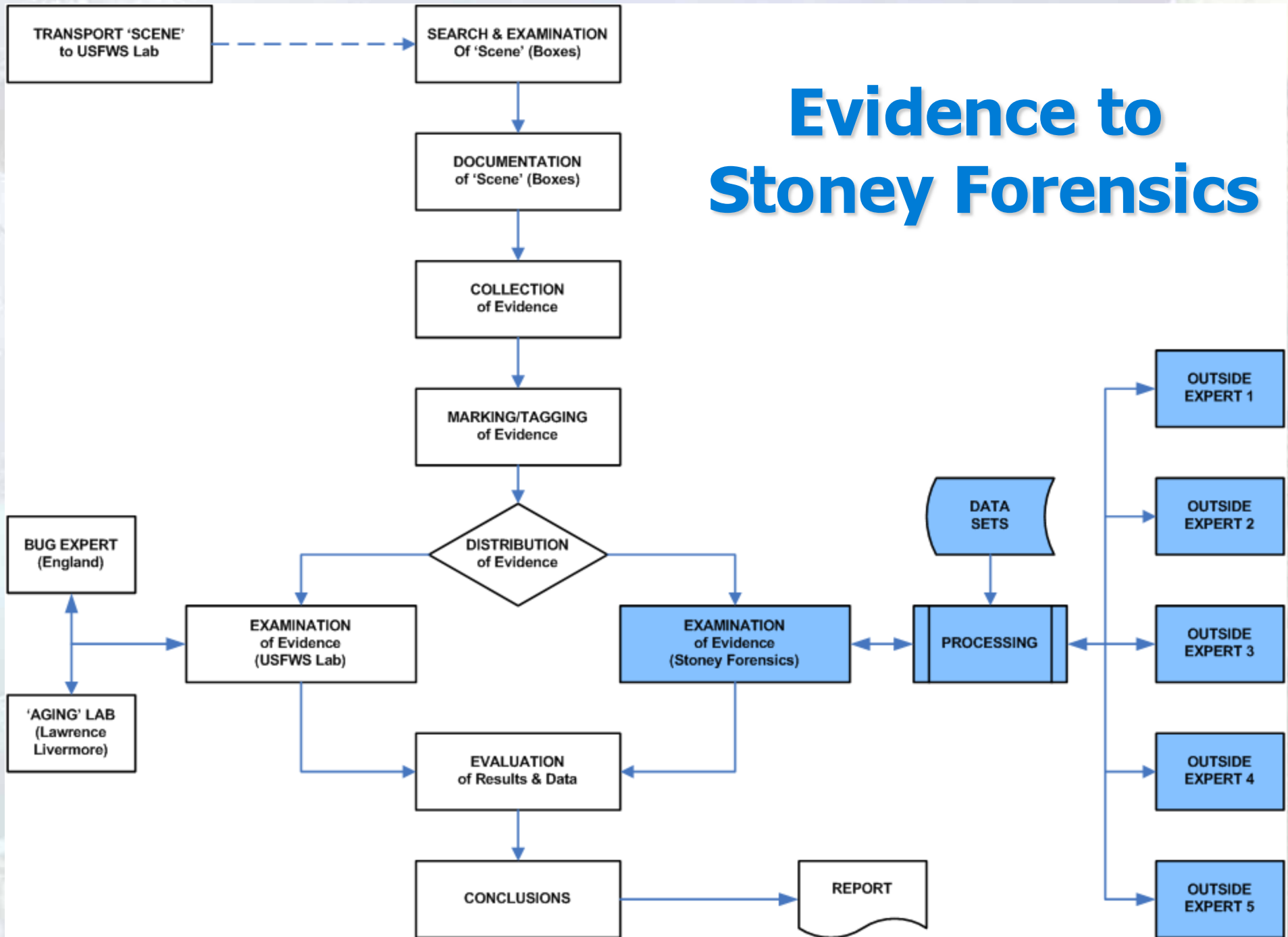
Ten ivory samples were sent to Lawrence Livermore Laboratories for carbon-dating testing to confirm USFWS Lab MALDI results ...

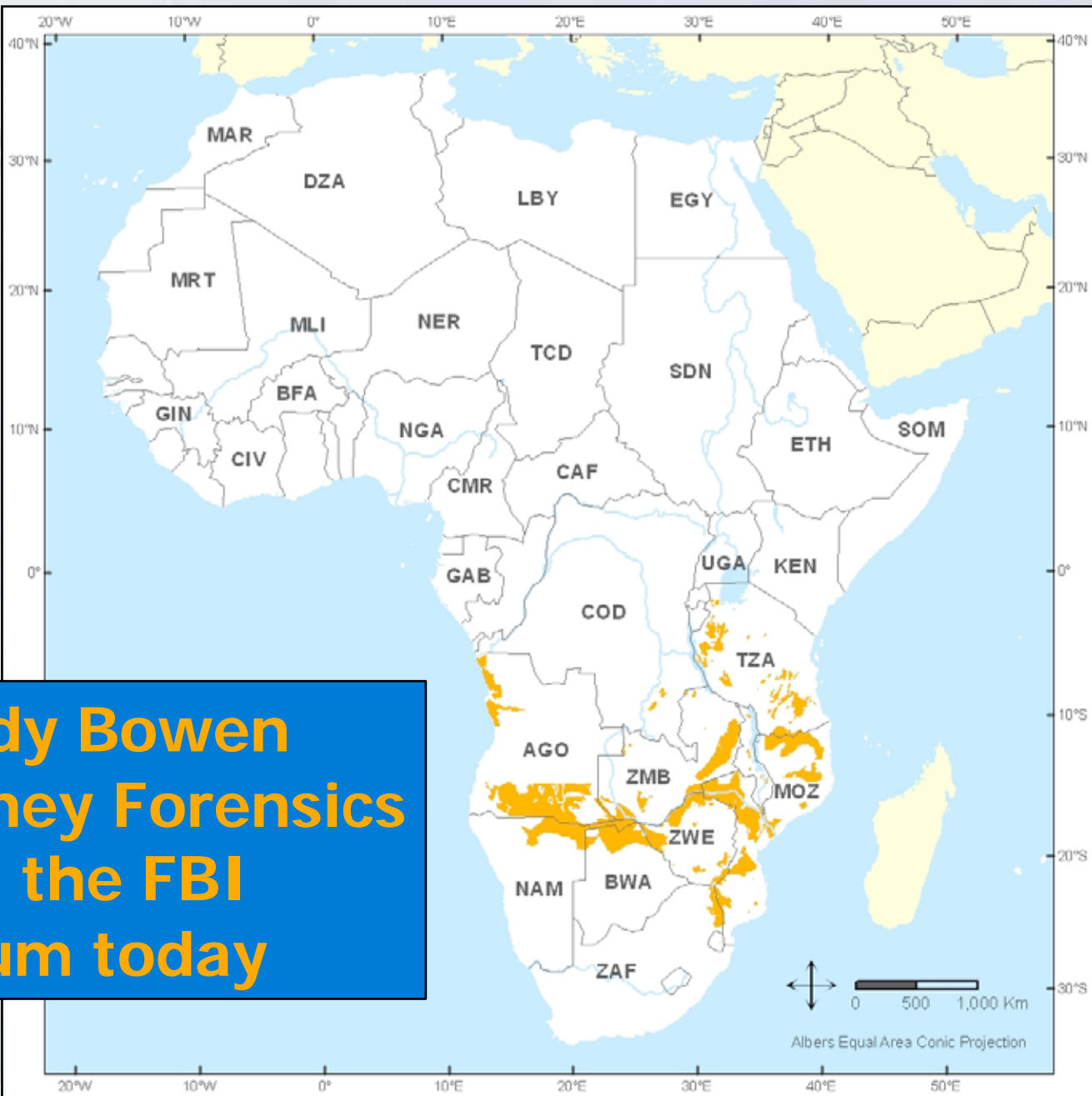
Carbon-Dating



The (very individualistic) tusks above came from an elephant killed between 1976-78 ... all others killed between 2000-2006 (hemoglobin dating).

Evidence to Stoney Forensics





**Note: Andy Bowen
from Stoney Forensics
is here at the FBI
Symposium today**

A collage of nature scenes. In the top left, a shark swims in blue water. In the bottom left, a seal is partially visible. In the center, two white birds with long necks stand on a rocky shore. In the bottom right, a brown bear is shown. On the far right, a close-up of a bald eagle's head is visible. The background is a soft, hazy blue.

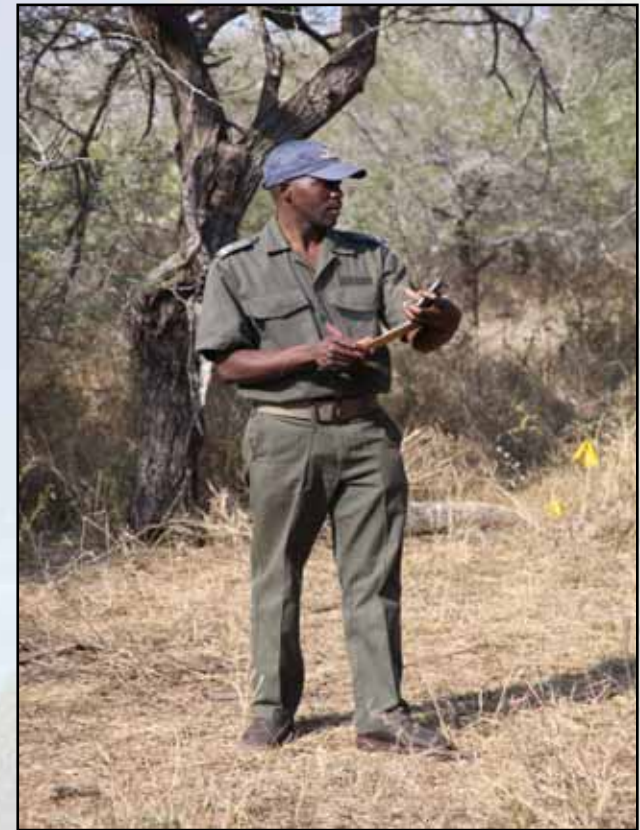
**How will we apply
these techniques in
the future??**

CSI Training for African Wildlife Rangers



At the International Law Enforcement Academy(ILEA)
in Gaborone, Botswana ... June 1-12, 2009

CSI Training for African Wildlife Rangers



At Kruger National Park in South Africa, June 15-16, 2009

A collage of various animals including a shark, seals, birds, and a bear, set against a background of a beach and ocean. The text "After the Training ..." is overlaid in the center.

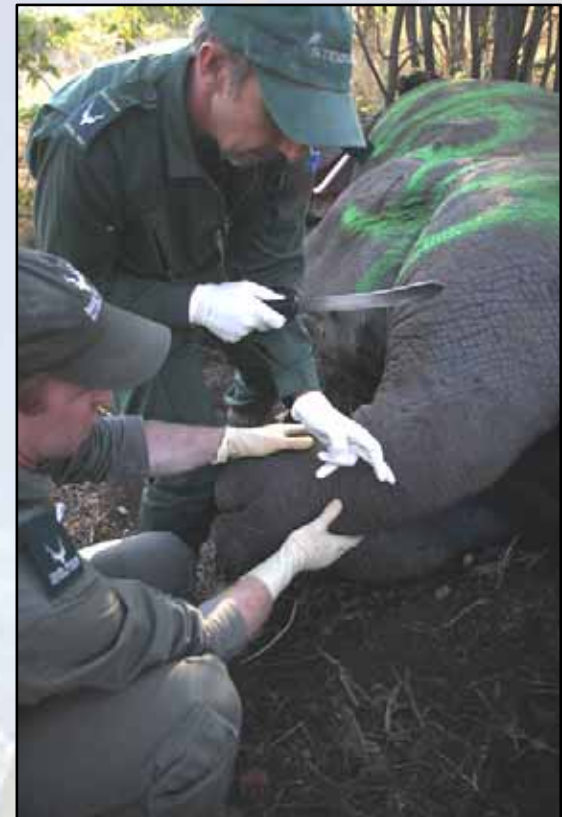
After the Training ...

Implementation of ...



Collecting soil

... a new
Elephant/Rhino
kill-site
collection kit
for African
Wildlife
Rangers



Collecting tissue

First CSI Response

Helicopter Flight to a recent rhino kill site 5 miles from the Mozambique border ...



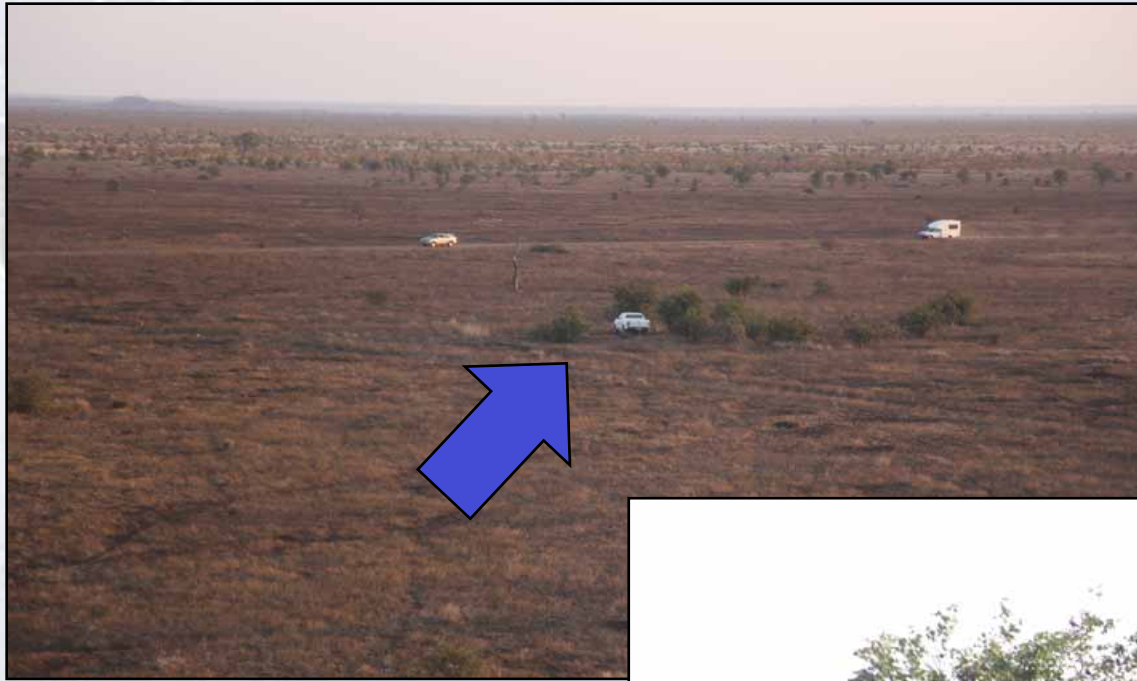
Kruger N.P.:

217 miles N to S
37 miles E to W

7,332 squ. miles







Picking up Johaán ...



Over the kill-site according to GPS





45 minutes later,
we find (actually
smell) the kill site ...



Discovering a piece of Trace Evidence



Marking the Evidence ...



Digging for a bullet ...





**Locating
a bullet...**





Rhino/Elephant Kill-Site Evidence Collection Kit #0001





Returning Johaan to his patrol vehicle and his search ...



The missing piece of evidence ...

Value in Asia:

\$75-85,000

