

# Golden Eagle Disease & Contaminant Surveillance

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Krysta Rogers

Wildlife Biologist

Wildlife Investigations Laboratory

California Department of Fish & Wildlife

# Overview

- Wildlife Investigations Lab
- Collaboration
- Wildlife Rehabilitation Facilities
- Data Collection
- Future Goals
- Recent investigations
- Emerging concerns



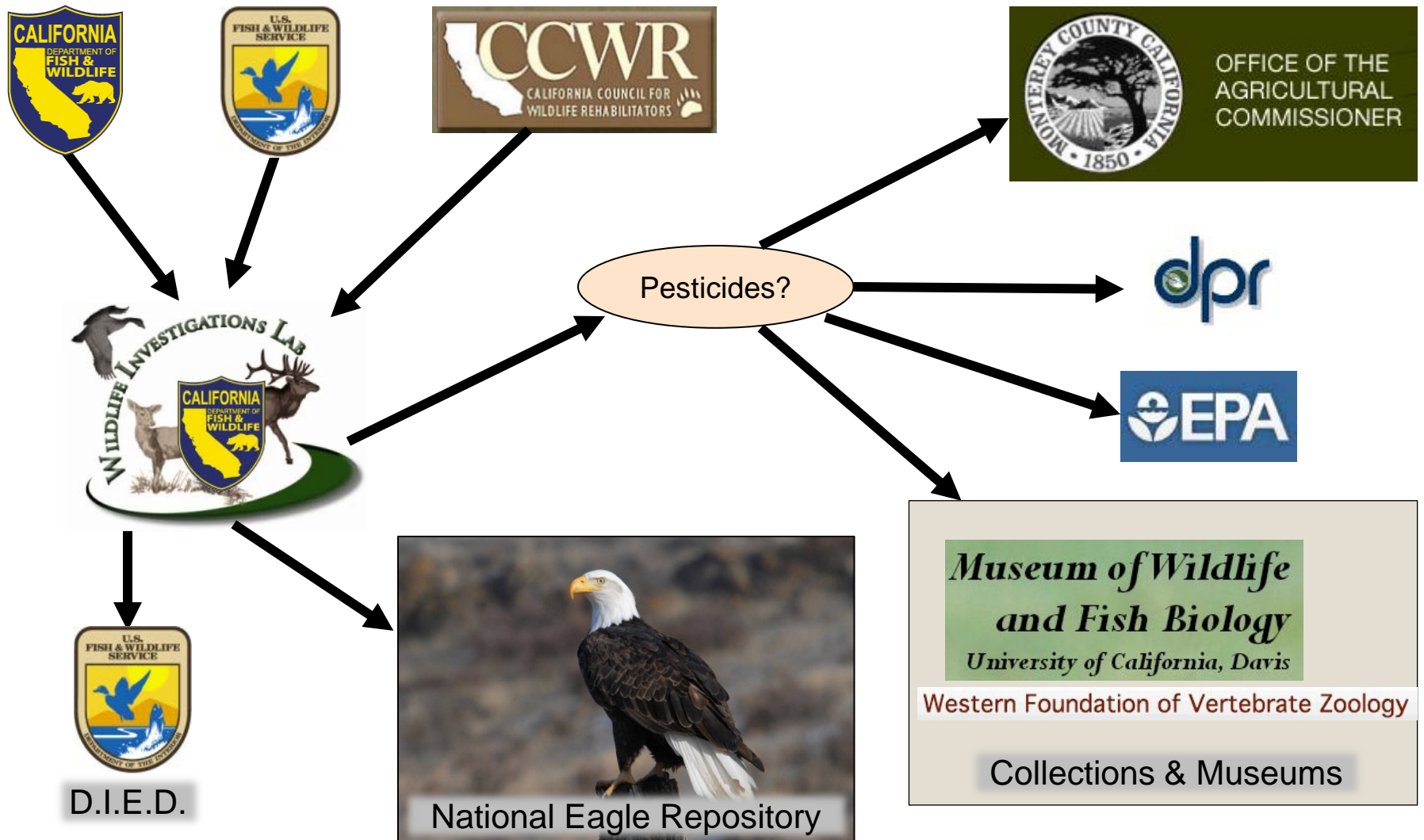
# Wildlife Investigations Lab

Fish & Wildlife Code WIL Mandate:

*“investigate all diseases of, & problems relating to, birds, mammals, or fish, & maintain laboratories to assist in such investigation”*



# Collaboration



# Wildlife Rehabilitation Facilities

- 96 centers
- Permitted by CDFW & USFWS
- ~70,000 animals / year
  - 70-75% birds
  - 1-5 GOEA / center / year

Year	Intake	Released	Euthanized	Other
2008	46	9	25	12
2009	45	8	23	14
2010	50	13	21	16
2011	33	4	20	9



# Dead Eagles

- Date/Location
- Age & sex
- Body measurements
- Photos
- Genetics: feathers, muscle
- Isotopes: feathers
- Disease: tissues
- Contaminants: tissues
- Determine COD

Eagle Necropsy			
WILDLIFE INVESTIGATION			
California Department of Fish and Game			
1701 NIMBUS ROAD, SUITE D, RANCHO CERRITOS, CA 94580			
Phone: 916-358-2790/Fax: 916-358-2791			
<b>Sample Collection</b>			
Sample Storage: 1 - Room temperature 2 - In -80°C freezer		Formalin <sup>1</sup>	
Pectoral muscle	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
Kidneys	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
Reproductive tract w/ adrenals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
Lungs	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
Heart (cut open both ventricles)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
Proventriculus	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
Gizzard	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
Gastrointestinal contents	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
Liver	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>

CAHFS/WIL Accession No.:
Person performing necropsy:
Name:
Affiliation:
Email:
Phone:
Remarks, etc.):

Diagnosis:
USFWS Dead
National Eagle
Include with sub



# Dead Eagles

## Disease

Viruses	West Nile virus, Avian paramyxovirus-1, & Avian influenza
Bacteria	Aerobic culture, <i>Salmonella</i> spp., & <i>Chlamydiophila psittaci</i>
Parasites	internal ( <i>Sarcocystis</i> spp.) & external parasites

## Contaminants

Heavy metals	lead, manganese, iron, mercury, arsenic, molybdenum, zinc, copper, & cadmium
Lead	recent (liver) & chronic (bone) exposure
Selenium	deficiency or excess

# Dead Eagles

## Pesticides

Anticoagulant rodenticides

brodifacoum, bromadiolone, chlorophacinone, coumachlor, difethialone, diphacinone, & warfarin

### *If indicated:*

Brain cholinesterase

Indicator for organophosphate & carbamate insecticides

Organochlorine insecticides & metabolites

dieldrin, endosulfan I, endosulfan II, endrin, hexachlorobenzene, heptachlor, heptachlor epoxide, lindane, methoxychlor, mirex, aldrin, BHC alpha, chlordane, p,p'-DDE, p,p'-DDD, p,p'-DDT, Dicofol, o,p'-DDE, o,p'-DDD, o,p'-DDT, & toxaphene



# Future Goals

- Initiate live-eagle sample collection
  - Wildlife Rehab Centers
  - Coordination with ongoing research
  - Sample collection
    - Feathers (genetics, isotopes)
    - Blood (genetics, antibodies, lead & AR screening)
  - Sample storage
  - Protocol & datasheet
- Summarize WIL's historical eagle records


**Live Eagle Sample Collection Form**  
 WILDLIFE INVESTIGATIONS LABORATORY  
 California Department of Fish and Wildlife  
 1701 NIMBUS ROAD, SUITE D, RANCHO CORDOVA, CA 95670  
 Phone: 916-358-2790/Fax: 916-358-2814

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**Sample Collection Form field names and descriptions and/or definitions.**

Rehab ID	Record the bird's rehabilitation center intake identification number.
Date	Date (mm/dd/yyyy) form was completed.
CAHFS/WIL Accession Number	Laboratory use only.

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Rehabilitat	Rehab ID:	 <p><b>Live Eagle Sample Collection Form</b>                  WILDLIFE INVESTIGATIONS LABORATORY                  California Department of Fish and Wildlife                  1701 NIMBUS ROAD, SUITE D, RANCHO CORDOVA, CA 95670                  Phone: 916-358-2790/Fax: 916-358-2814</p>
Recorder's	<input type="text"/>	
Collection	<input type="text"/>	

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Notify Nicole Carion ([Nicole.Carion@wildlife.ca.gov](mailto:Nicole.Carion@wildlife.ca.gov)) & Jennifer Brown ([jennifer.c.brown@fws.gov](mailto:jennifer.c.brown@fws.gov)) upon intake of any golden eagle or bald eagle.  
 E-mail or fax completed form to Krysta Rogers, [Krysta.Rogers@wildlife.ca.gov](mailto:Krysta.Rogers@wildlife.ca.gov), fax 916-358-2814.  
 For laboratory submissions (e.g. blood, feathers, carcasses) please contact Krysta Rogers ([Krysta.Rogers@wildlife.ca.gov](mailto:Krysta.Rogers@wildlife.ca.gov); 916-358-1662) or Stella McMillin ([Stella.McMillin@wildlife.ca.gov](mailto:Stella.McMillin@wildlife.ca.gov); 916-358-2954), before shipping samples or carcasses.

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Date:	CAHFS/WIL Accession No.:
Rehabilitation Center:	Recorder's name:
	Phone:

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**Collection Location Description & Coordinates**

Location where bird was found (address, intersection, park, landmark, etc.):

Street:  Nearest city:  County:

Land use description:

GPS Coordinates (if known):

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**Bird Information**      Species:  Bald Eagle     Golden Eagle

Intake date:       Reason for intake:

Sex:  Male     Female     Undetermined    Molt, feather condition or wear:

Age:  Nestling     Fledgling     Juvenile     Adult     Undetermined

Body weight (grams):     Fat deposition:  None     Trace     Moderate     Heavy

Band number:     Right leg  Left leg

Other markers (describe):

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**Exam & Diagnostics** (describe or submit copy of patient history)

Physical exam:

Treatments:

Diagnostics:

Blood: Volume  cc    PCV  %    Total Protein  g/dl    WBC     Lead     Other:

Prognosis:  Poor     Fair     Good     Excellent

Fate:  Released     Transfer:      Captivity:      Died\*\*

Fate date:       \*\*submit body to CDFW - WIL for necropsy & sample collection

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**Sample Collection (live eagle only)**

Photos:  Head/Bill     Injuries    Wings(extended):  Dorsal     Ventral    Tail (fanned):  Dorsal     Ventral

Feathers (3-5 pulled from breast, stored in paper envelope):

Whole Blood (collected in EDTA tubes; 3cc preferred):  Volume  cc

Date submitted to CDFW - WIL\*:       \*See storage recommendations on page 2 or contact WIL for details.

DFW/WIL/Eagle Rehab Sample Collection Rev. 04/25/13

# Recent Investigations

2007 - 2013

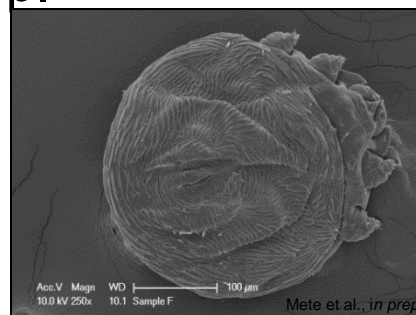
Finding	GOEA	BAEA
West Nile virus	2/4	2/6
Avian cholera		1/7
Sarcocystosis	2/3	1/4
Lead	1/5	2/6
Anticoagulant Rodenticides	2/4	3/4
Trauma RE	8/12	
Trauma other		2/7

\*positive/number evaluated



# Mange in California

- Golden eagles
    - Severe feather loss on head, neck, legs, & lower abdomen
    - Poor feather condition
  - Cases
    - Dec 2012; San Benito Co.
    - Jul 2013; Alameda Co.
    - Aug 2013; Monterey Co.
  - Skin burrowing mite
    - *Knemidectoptes* spp.
- First occurrence



# Ticks in Arizona

- Bald eagle nestlings
  - 8 deaths over 3 years
- Tick identification
  - *Argas radiates* & *A. ricei*
  - *Argas* spp. (2013, not yet identified)
- 2013, Golden eagle failed nest
  - Recovered *Argas* spp. at site
  - Unknown if ticks played a role in nest failure

➔ Kenneth “Tuk” Jacobson  
Raptor Management Coordinator  
Arizona Game & Fish  
Phone: (623) 236-7575



# WNV in Utah

- Bald eagles
  - 54 found sick & dead from 1 Dec 2013 to present in 6 counties
  - Clinical signs: body tremors, paralysis & weakness in wings & legs, progressive seizures
  - COD: reported as West Nile virus<sup>1,2</sup>
- Eared grebes
  - Great Salt Lake
  - >15,000 died in Nov & Dec 2013
  - COD: reported as West Nile virus<sup>1,2</sup>
- Bald eagles presumably became infected from eating eared grebes

<sup>1</sup>Utah Veterinary Diagnostic Laboratory, Logan, UT

<sup>2</sup>National Wildlife Health Center, Madison, WI



# Questions?

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Wildlife Investigations Lab  
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